LAND USE RIGHTS TRANSACTION, CREDIT CHOICES, RISK RATIONING, AND ENTREPRENEURSHIP AMONGST CHINESE FARM HOUSEHOLDS

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LAND USE RIGHTS TRANSACTION, CREDIT CHOICES, RISK RATIONING, AND ENTREPRENEURSHIP AMONGST CHINESE FARM HOUSEHOLDS

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Using data from 730 farm households in Shaanxi province collected in November 2010, three studies focusing on a policy reform allowing Chinese farmers to transact land use rights and its impact on risk rationing in a rural credit market and entrepreneurial intention in China are presented.

The first study is "On the Transaction Values of Land Use Rights in Rural China under Rural Policy Reform". This study examines the economics of transaction in LURs, estimates the value at which LURs could transact in equilibrium, and analyzes factors that would affect these price changes. We evaluate farmer's intention to buy and sell LURs and how much they are willing to pay and receive for LURs.

The next study is "Risk Rationing in China Rural Credit Markets" providing a specific test of the Boucher et al. (2008) framework to determine the extent of risk rationing amongst potential rural borrowers. We find the incidence of risk rationing in rural China is in the order of 6.5%, with about 14% being quantity rationed and the remainder being price rationed. We investigate factors associated with risk rationed, quantity rationed and price rationed farmers and provide evidence that the elasticity of demand for credit is different among them.

The final study draws a comparison between entrepreneurship and technology adoption. We apply an 'entrepreneurship as technology adoption' model to a unique dataset collected in

Shaanxi province, China and Kentucky, USA. The uncertainty in household income and changes in economic environment during the Chinese Land Use Rights Regime and the US Tobacco Transition Payment Program lead many individuals into entrepreneurial activities. We examine the factors associated with entrepreneurial intention and compare entrepreneurs' attitude between two countries.

BIOGRAPHICAL SKETCH

Sivalai Vararuth Khantachavana was born in 1977 in Bangkok, Thailand where she spent most of her childhood. After graduating from Trium Udom Suksa School in 1995, she enrolled at the Department of Economics, Chulalongkorn University. While attending Chulalongkorn University, she had internship with the Bank of Thailand in the financial institution regulations department. She graduated from Chulalongkorn University with a Bachelor of Economics, First Class Honors, in December 1998. After working for the Ministry of Finance as an economist, and the National Economic and Social Development Board as a policy and plan analyst, she was awarded the Royal Thai Government Scholarship to pursue a Master of Science degree in Policy Economics at University of Illinois at Urbana-Champaign in 2000. Upon completion of her Master of Science degree in 2001, she worked for the Department of Highways, Ministry of Transport, as an economist. Her main responsibilities were doing feasibility studies of the highway projects in Thailand and international highway networks connecting neighboring countries. In 2006, she was awarded the World Bank Graduate Scholarship to pursue a Master of Science degree in Economics at the London School of Economics and Political Science. She subsequently began her doctoral study at Cornell University in the Charles H. Dyson School of Applied Economics and Management in 2007. While attending Cornell University, she received a research assistantship and a teaching assistantship during August 2008 – May 2011. She is a co-author, with David Just and Richard Just, of *"Empirical Challenges for Risk Preferences and Production"* published in the Annual Review of Resource Economics in October 2010. She plans to stay in Thailand with her family and work in the field of Economics after receiving a Ph.D. degree.

I dedicate this work to my parents, Nakorn and Veerawan Vararuth,

and my husband, Ruthaphol Khantachavana.

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CHAPTER 1

INTRODUCTION

China's transition from a centrally planned economy to a market economy began at the end of 1978. Chinese government launched its economic reforms in an effort to increase the efficiency of its economy and speed up economic growth. Agriculture was the first sector to be reformed in 1978 and the reforms were rapidly introduced to the whole country. Successes have been achieved on a broad front, in terms of such criteria as output growth, living standards, poverty reduction and inflation.

The most important change in China rural reform and agricultural sector was the replacement of collective farming with a household-based system (Lin et al. 1996), also known as the household responsibility system that helps encourage farm investment, and decrease the land-tenure insecurity. It has been recognized that the land-tenure insecurity has several effects on agricultural production. For instance, it reduces productivity of the land by decreasing investment and discouraging land transfers from low to high productivity producers. In addition, because farm households do not own their land, they cannot use it as collateral in the credit market. Therefore, the rural land reform in China and the effort to increase the land-tenure security have facilitated independent transfer and affected the markets for other important farm inputs, such as credit and labor markets.

During the economic transition toward a market system, the Chinese labor market is evolving. As an important means to facilitate efficient allocation of labor resources, the development of the labor market has important implications for the success of the economic reform. In particular, the urbanization in China has increased tremendously following the initiation of the reform and opening policy. China’s rural labor market and employment structure

have changed dramatically in the last 30 years as millions of rural workers have migrated to urban areas to find nonfarm employment. A variety of policies is thought to restrict permanent migration to cities but allows a large amount of temporary migration. For example, the land-tenure system has helped discourage labor movement out of agriculture because households will lose their land use rights (LURs) if they leave the village. However, the Chinese labor market is moving toward a market mechanism. The employment in a state-owned sector is declining but the private sector and entrepreneurial activities are rising rapidly.

The relaxing of the state's control over the economy allowed the emergence of entrepreneurs, who have transformed the economy into one increasingly driven by competition, innovation and productivity. Moreover, the most important source of the economic growth was from firms that were begun by local leaders and from collectively-run township and village enterprises. Nevertheless, an institutional challenge faced by entrepreneurs has been a limited access to credit. Certainly, increasing access to credit affects farm households' agricultural production decisions and entrepreneurial intentions, but formal credit institutions in China are still poorly developed, while households increasingly rely on informal credit institutions. The financial reforms have not succeeded in creating a modern and efficient financial sector.

Since the economic reform and urbanization in China's economy generate changes in China's rural markets for land, labor and credit as well as entrepreneurial activity, we are further interested in examining the policy change focusing on the transaction of LURs and its impact on risk rationing in a rural credit market and venture creation in China. With the institutional and policy changes in the land, labor, and rural credit markets, farmers are able to take advantage of the new economic environment and improve their agricultural productivity to increase their incomes and economic growth.

1.1 Motivation

Since the end of the 1970s, with the reform of China's rural land system, agricultural production and the rural economy of China have greatly developed and flourished. In the early 1980s the adoption of the "household contract responsibility system" dramatically altered the relationship between China's farmers and the land they cultivated. The system has realized the separation of land ownership from the LURs. In addition, it has adjusted the production and distribution relations in rural China, changed the way of agricultural production and management, motivated the peasants' enthusiasm for production, and fully utilized technology and resources. The household contract responsibility system has contributed to the development of China's agricultural and rural economy and its industrialization in the following several aspects. First, it brought about extraordinary growth in agricultural production. Second, the rapid growth of agricultural production has caused a corresponding increase in farmers' income. Third, the system has driven China's industrialization and the massive transfer of rural surplus labor.

Despite these benefits of land reform, there is a growing concern about China's ability to allocate land efficiently and to reduce the wasteful use of scarce farmland in a period of rapid economic and social change. This has stimulated a host of new research focusing on land use, property rights and land management in China. Previous researches have examined whether the land management system has been providing sufficient incentives for farmers to utilize land efficiently and to make investments, while simultaneously helping to improve welfare and equity as well as to protect agricultural land (see Brandt et al. (2002); Ho and Lin (2003)).

In 2008, The Chinese government has considered the policy and possibility of LURs transfer and transactability as farmers are allowed to buy and sell LURs for the first time. This could draw hundreds of millions of farmers more firmly into the market economy. Some

economists believe that the policy reform allowing Chinese farmers to buy and sell LURs would lead to more efficient land use and allow much larger farms to be established. High productive farmers are more likely to buy LURs while low productive farmers are more likely to sell LURs and work off-farm. Therefore, it is interesting to see what would happen if the Chinese government made it legal for farmers to buy or sell LURs, who would be buyers, who would be sellers and at what price. This analysis is represented in Chapter 2 investigating the structure of a LURs market should LURs contracts become widely transactable. This study is the first to provide a preliminary assessment of farmers' willingness to buy and willingness to sell LURs.

In recent years, China's government has made improving the welfare of rural residents a priority, but the debate over the best way to help farmers get better access to bank credit has been questionable. In order for farmers to make long-term, productivity-enhancing and income-generating investments on land, improved access to a credit market is a key. Secure property rights which can be pledged as collateral for loans would facilitate farmers' application for loans from financial institutions. A collateral loan is often offered at a lower interest rate than an unsecured loan, because there is a guarantee of repayment should the borrower default on the loan.

Nevertheless, previous literature has shown the existence of risk rationing and its significance as the borrower voluntarily withdraws from the credit market even he has the collateral wealth needed to qualify for a loan contract. Boucher et al. (2008) (BCG) provide an economic definition for 'risk rationing' and through a utility theoretic model present some specific and testable hypotheses. In fact, in a 2009 survey of Chinese farmers in Gansu and Shaanxi provinces we asked a small number of questions related to the hypothetical possibility of the mortgagability of LURs as a form of collateral (Turvey et al. 2011). It was found that a large

number of farm households would not use LURs as loan collateral. The results strongly implied of the possibility that risk rationing was wide spread in rural China, and if so this would dampen the overall impacts of credit reforms currently under way in China.

In 2010, we designed survey questions applying the direct elicitation methodology (DEM) so that each credit rationing status could easily be extracted. It was constructed to specifically isolate risk rationing under the specific conjectures and hypotheses raised by BCG. Chapter 3 provides an empirical assessment of risk rationing theory and hypotheses proposed by BCG. Evidence of risk rationing in rural credit markets would suggest that the effectiveness of land titling policy encouraging farmers to pledge their rights as collateral security may be overestimated. The study is believed to be among the first empirical validation of the risk rationing theory.

As mentioned above, the Chinese government has considered the possibility to liberalize farmers' land use right to enhance rural development. The issuance of a policy concerning the Advancement of Rural Reform and Development approved by the Central Committee on October 12 2008, allowed farmers to "lease their contracted farmland or transfer their LURs" to boost the scale of operation for farm production and provide funds for them to start new businesses. A significant increase of private enterprises has ensured a rapid and sustained growth of rural enterprise and the non-agricultural employment opportunities for rural residents.

Moreover, the policy allowing farmers to use rights to farmland and residential land as collateral for loans would increase access to a credit market. Rural credit helps rural poor economy in a variety of ways. First, access to credit can considerably increase the ability of households with no or few savings to meet their financial needs for agricultural inputs and productive investments. Second, it could also increase rural poor households' willingness to

adopt new technologies that raise both average levels and riskiness of income. Finally, it allows rural households to smooth their consumption in the case of unexpected event. However, the existence of credit and risk rationing may have significant negative impacts on income and welfare, especially for poor households. Credit constraints prevent individuals from undertaking desired activities and from realizing profit-maximizing investment levels in the activities they do engage in. Thus entrepreneurially talented but poor individuals are prevented from starting businesses.

Chapter 4 attempts to analyze the impact of structural changes on farmers' entrepreneurial decision. We compare the similarities of venture creation and the adoption of a new technology and investigate the factors influencing farmers' entrepreneurial adoption decision during the transition period of the local economy. In this chapter, we employ two novel data sets consisting of a survey administered to Chinese farmers in Shaanxi province and tobacco farmers in Kentucky. The first survey has been carried out in Shaanxi province in November 2011. The survey collected detailed information of the Chinese farmer on entrepreneurial decision and attitude toward the hypothetical implementation of LURs transaction in China. The second survey collected detailed information on the socioeconomic background, entrepreneurial decision and attitude, livelihood disruption, ability levels and personality traits of the Kentucky farmer at the time of tobacco buyout program. We compare entrepreneurial attitudes and factors associated with entrepreneurial decision between Chinese and Kentucky farmers. The uncertainty in household income and changes in economic environment during the Chinese Land Use Rights Regime and the US Tobacco Transition Payment Program lead many individuals into entrepreneurial activities.

1.2 Research Objectives

The purposes of this dissertation and the key questions that we attempt to investigate in this dissertation are as follows.

1.2.1 Chapter 2: On the Transaction Values of Land Use Rights in Rural China under Rural Policy Reform

Objective 1: examine how Chinese farmers might respond if the Chinese government made it legal for farmers to buy or sell LURs. The Chinese government has considered the possibility of liberalizing farmers' ability to transact LURs including selling and mortgaging the rights, to boost rural development.

Objective 2: examine the economics of transaction in LURs, estimate the value at which LURs could transact in equilibrium. Land use rights requires a complex understanding of market transparency, credit markets, farm size-productivity relationships, agency conflicts, market risks, covariate risks, contingent markets, rent seeking, government intrusion and market distortions (Binswanger et al. 1993), many of which are absent in rural China. It is important to understand how, in the presence of these complexities, a market for transactions in LURs will evolve in rural China, who would be buyers, who would be sellers and at what price.

Objective 3: analyze the price elasticity of LURs and factors that would affect changes of LURs value. We determine some baseline characteristics that define and differentiate buyers and sellers and WTP and WTB values. Factors of interest are demographic factors, farm attribute and production factors, profitability factors, debt, credit and liquidity factors, attitude toward risk factors, and other variables including business climate, migrant farm labor, entrepreneurship, computer and internet, politics, and urban factor.

Objective 4: evaluate farmer's intention to buy and sell LURs and how much they are willing to pay and receive for LURs. Because no formal market exists to transact LURs, this study is the first to provide a preliminary assessment of farmers' willingness to buy and willingness to sell LURs. We employ a self-declare questions approach and a Multiple Bounded Discrete Choice (MBDC) approach, and use contingent valuation (CV) techniques to extract measures of willingness to sell (WTS) and willingness to buy (WTB) LURs.

Objective 5: examine characteristics of potential buyers and sellers. Understanding the similarity and difference of these characteristics between LURs buyers and sellers will help the government formulate a better policy to directly support a target group.

Objective 6: explore potential policy implications. More detailed investigation of the factors affecting the implementation of legal and institutional change aiming to make property rights more secure could provide important insights for policy makers.

1.2.2 Chapter 3: Risk Rationing in China's Rural Credit Markets

Objective 1: provide a specific test of Boucher et al. (2008) framework on risk rationing. We find risk rationing as a topic of inquiry to be critically important in understanding borrower behavior and credit decisions.

Objective 1.1: explore whether the insurance markets, asymmetric information, risk and collateral are essentially related to risk rationing in economic context. From definition, they assume these conditions are important for risk rationing to occur.

Objective 1.2: test hypotheses that describe the most important factors explaining the existence of risk and quantity rationing, namely 1) Wealth-biased quantity rationing, 2) Risk rationing and financial wealth, 3) Risk rationing and productive wealth.

Objective 2: use the direct elicitation methodology (DEM) where a set of questions directly elicits the household's status as either credit constrained versus unconstrained.

Objective 3: estimate credit demand elasticities by credit constraint status. We want to explore the sensitivity to interest rate of risk rationed, quantity rationed, and price rationed farmers.

Objective 4: examine the attributes of risk rationed, quantity rationed, and price rationed farmers. Independent variables designed to capture the effects on credit rationing are demographic variables, measures for wealth, measuring for risk aversion and prudence, measure of insurance market participation, asymmetric information, elasticity of demand for credit, formal and informal credit, the willingness to borrow if they can use their LURs as collateral for a loan, and entrepreneurial activity.

Objective 5: explore potential policy implications.

1.2.3 Chapter 4: Livelihood Disruption and Venture Creation: Entrepreneurship as Technology Adoption, A Comparison between Shaanxi Farmers and Kentucky Farmers

Objective 1: propose the conceptual model of entrepreneurship based on the technology adoption literature. We compare the similarities of the adoption of a new technology and the venture creation. Specifically, when a new technology is available, decision-makers continuously evaluate whether or not to adopt. The technology will be adopted when the discounted expected benefits of adoption are greater than the cost. Similarly, when the expected profit of new venture is greater than current activities, decision-makers will start new businesses.

Objective 2: examine and compare entrepreneurial characteristics and attitude of Shaanxi and Kentucky farmers to better understand their entrepreneurial uniqueness, opinion and business environment among two regions.

Objective 3: examine factors influencing entrepreneurial adoption decision and estimate the effect of internal family events on the decision to start a new business. We draw an analogy between factors affecting technology and entrepreneurial adoption and investigate whether Shaanxi and Kentucky farmers are influenced by different factors when making decisions to enter entrepreneurship. Key determinants of entrepreneurial intention are demographic factors, economic factors, farm structure, human capital, social network and learning, distance and geography, tenure, credit constraint, and attitude toward risk.

Objective 4: explore potential policy implications.

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CHAPTER 2

ON THE TRANSACTION VALUES OF LAND USE RIGHTS IN RURAL CHINA UNDERE RURAL POLICY REFORM

2.1 Introduction

The Chinese government has considered the possibility of liberalizing farmers' land use rights to boost rural development. Understanding land markets in developing regions requires a complex, not mutually exclusive, combination of market transparency, credit markets, farm size-productivity relationships and other agency problems, market and covariate risks and the presence of contingent markets, rent seeking, government intrusion and market distortions (Binswanger et al 1993). The issuance of a policy concerning the Advancement of Rural Reform and Development allowed farmers to "lease their contracted farmland or transfer their land use rights" to boost the scale of operation for farm production and provide funds for them to start new businesses. Consequently, markets for the lease of contracted farmland and the transfer of farmland use rights shall be set up and improved to allow farmers to sub-contract, lease, exchange and swap their land use rights, or joined share-holding entities with their farmland. Such transfers of land-use rights must be voluntarily participated by farmers, with adequate payment and in accordance with the law" (Chinareview.cn 2008). Some economists believe that the policy reform allowing Chinese farmers to buy and sell land use rights would lead to more efficient land use and allow much larger farms to be established. Part of this optimism likely arises from the growth observed in agricultural output and grain output immediately following the 1978 reforms through 1984 and the disappointing growth thereafter (See Brandt et al. 2002). If a market for trading farmland use rights developed, farmers could gain a new source of cash income that could help alleviate the poverty in rural economy. This would also create more asset

wealth for farmers and strengthen land security, which would in turn provide access to credit markets and encourage farmers to invest in farming and increase productivity.

The purpose of this study is to investigate the structure of a land use rights market when land use rights contracts become transactable. The main objectives are to 1) examine the economics of transaction in land use rights; 2) evaluate farmer's intentions to buy and sell land use rights and how much they are willing to pay and receive for land use rights; and 3) examine factors associated with potential buyer and seller of land use rights. Based on a household survey of 730 farm households we employ a polychotomous choice and contingent valuation techniques to extract measures of willingness to sell and willingness to buy land use rights. We show that there is a great disparity between the minimum price at which a farmer will sell and that at which a buyer is willing to buy. The disequilibrium is so significant that we doubt that an equilibrium matching buyers and sellers would obtain any time soon. This study is the first to provide a preliminary assessment of farmers' willingness to buy and willingness to sell land use rights.

2.2 The Political Economy of Land Use Rights in China

The recent discussions of land use right reform is not new to political debate in China and is discussed in detail in Kung (1995), Liu, Carter and Yao (1998), Ho (2001), Brandt et al. (2002), and most recently by Wang (2008) and Chau and Zhang (2011). In China the Western notion of property rights when measured against urban growth, industrialization, population migration and food security is a tenuous balancing act between competing policies and political sacrifices must be made. These are the common arguments, but Ho (2001) argues that it is much more complex in China, with a targeted policy of what he refers to as institutional indeterminacy. This provides the Central Party the flexibility to respond to societal developments, and to retain

this flexibility it employs a system of deliberate institutional ambiguity (see also Kung 1995). In other words the wavering of the Central Committee over whether to permit mortgaging land use rights, or to permit inter-farm (as opposed to farmer-SME) sales of land use rights is by necessity. The most obvious problem faced by the Central Party is the balancing between urbanization and the depopulation of rural areas. If the rate at which farmers would sell their rights and migrate to urban areas exceeds the rate at which they can be absorbed by the newly urbanized centers conditions might very well be worse. The vastness of the rural population in China is not conducive to the natural migration for economic benefit that came about with defined property rights and industrial growth in Western democracies.

It is, however, unrealistic to demagogue the second-best realities of the socialist system that is in place and has been evolving since 1949. By allowing buy-sell transactions the government (state or collective) is essentially relinquishing control over its ownership position in the land. This is no easy task as Ho (2001) and Deininger et al. (2006) point out. Under the old collective regime land ownership was allocated between the commune, the production brigade and the production team, but in the decollective period these were ambiguously reallocated in terms of ownership and managerial responsibility to the township/town, administrative village and natural village, each with their own industrial objectives and infrastructure responsibilities. In addition there are often conflicting rights in forestry, grassland wasteland and waterways that are owned by the State yet occupied by the collective. How can such a system in practice operate when not only are ownership rights ambiguous, but property rights (as defined by the terms of the land use rights) are not easily reconciled? It is unlikely that such a market could exist without legal and social conflicts.

Based on a 1994 survey Liu et al. (1998) report that nearly 75% of villages permit individuals to rent out land for compensation (with 1/3rd requiring administrative approval) and 50% of villages permitted the actual sale of use rights, with most requiring administrative approval. Since 1999 it has been legal to sell and transfer use rights on state lands for real estate development and agriculture, and within the collective system transactions in the form of lease contracts is in principle legal, but as indicated in Liu et al.'s (1998) survey, in the majority of cases legal exchanges would likely need approval from the village committee[1]. Informal hand-shake transactions (*zhuanbao*) are quite common and are (in our experience) overlooked by the village committee (Ho 2001; Brandt et al. 2002). In Kung's (1995) 1993 survey the majority of these transactions were within families and it is also noted that a reason not to acquire new land was due to transactional cost burdens in taxes (see also Kung and Liu 1997). Brandt et al. (2002) using surveys conducted in 1988 and 1995 found that between the two survey periods formal rental contracts (mostly between relatives as well) rose from only 0.6% to 3%, despite the fact that 75% of villages had unrestricted opportunities to lease. Even with the potential in place to buy land use rights this does not necessarily mean that all of the traditional benefits arising from recognized property rights and land ownership will be recognized by farmers. In a 2009 survey for Shaanxi and Gansu farmers, Turvey et al. (2011) report that only 21.2% of farm households indicated willingness to sell the land and 39.8% indicating agreement to buy additional land use rights. The leveraging affect, or collateral value, may be overstated however, with only 35.4% of farmers agreeing that they would use the land use rights as collateral for loans. This is actually

[1] In Liu et al (1998) it is not clear whether the sale of land use rights were between farmers as we investigate in this paper. It is unlikely that these sale transactions were amongst farm households since this would permanently disrupt the egalitarian allocation of land amongst villagers (i.e. newborns, or new spouses). Rather, these transactions were most likely approved to develop housing units or small and medium size enterprises (SME) on village-owned lands with any monies going towards the village funds for infrastructure and further development (see Ding 2003).

lower than about 47% of Sichuan and Hunan households who agreed to use land rights as collateral in a 1993 survey by Kung (1995).

Kung (1995) notes that of the two conditions required for the emergence of private property rights, increasing population and commercialization, the first has been met in China while the second had, in 1995, not. Of course the rapid expansion of commercialization and the expansion of the industrial base from the eastern coastal provinces towards the west have much improved since 1995, and in part this is one of the drivers of land reforms. Even so, Ho (2001) points out that in large swaths of China the pricing of rural land is an 'ideological taboo' which inhibits an economically meaningful exchange of farmland in a liquid and transparent form.

Any land use rights market will have several unique characteristics. The market is much less liquid than agricultural product markets, meaning that transactions take longer to occur and are often more complex than most agricultural products. The major factor driving the farmland market is the return to agricultural production. However, some land markets can also be influenced by a number of factors such as land attribute, demographics, profitability, credit access, attitude toward risk of the land contract owner and the potential conversion to urban development. Risk does not only apply to market and the environment but insecurity also arises from the village committee's powers (albeit reduced in 1997) to re-divide holdings depending on family size, village populations and available village lands (Kung 1995). Brandt et al. (2002) provide evidence that these allocations and the unbalanced divisibility of land amongst family members (labor) leads to static inefficiency. The uncertainty around future earnings potential can also significantly reduce the amount of transactions that take place in the market (see Jin and Deininger (2009) on rental contracts and ambiguities and uncertainties about land use rights).

2.3 Background of Land Use Rights

Throughout the pre-1949 revolutionary years and for a few years after independence land was reallocated from the land rich to the land poor. However shortly thereafter staring in the early 1950's these lands were re-accumulated into the Soviet-style collective model where it remained through 1978. By then the inefficiencies due to lack of property rights and incentives was weighing on the central party. Between 1978 and 1984 farmers were allocated, according to egalitarian principles, small parcels of land on year to year leases. So long as regional quotas on productivity were met farmers could sell excess commodities into the market place. This provided the incentives to increase production but with land use rights allocated on yearly certificates and the propensity for village cadres to reallocate land parcels on a frequent basis, the lack of property rights eliminated all incentives for capital improvements (Kung 1995, Brandt et al. 2002)[2]. To counter this problem land use rights were extended to 15 years in 1984 and then to 30 years in 1993 and a proposed 70 years in 2008[3].

In China, land use rights are the rights for natural persons, legal persons or other organizations to use land rights for a fixed period of time. China adopted a dual land tenure system under which land ownership is independent of land use rights. The land is either owned by the state ("State Land") or by rural collective economic organization ("Collective Land"). The term of land use rights varies depending on different land use purpose. For example, if a piece of

[2] Indeed, in our study area in Shaanxi there has been rapid conversion of grain land to fruit lands (e.g. kiwi fruit) and greenhouses for tomatoes, peppers, and other vegetables, not because of incentives from enhanced property rights but from low interest loans issued under specialized programs. While the mortgageability of land use rights has frequently been discussed, this is permitted only in some pilot areas in China, and even so there are few incentives for lenders to actually lend against the ownership of a right rather than the ownership of the land itself.

[3] In practice the 30-year contract was modified in 1997 to offer protections against redistribution of land. Furthermore, it was acknowledged that the 30-year right was in essence a perpetual right since it would be renewed in perpetuity. Even so, a 70-year contract, using the present value model of Wang (2008) would essentially be equivalent to a perpetual lease on the economic value of production. In essence the present value of a 70-year right would be only marginally indistinguishable from the present value of economic rents on the land itself. But with farm sizes averaging, for example 4.9 mu (approximately 5/6th an acre) per household in this paper's sample, even with a 30 or 70 year right capital improvements would not universally lead to the technical, allocative, and economic efficiencies required to meet food security objectives.

state land is used for industrial, educational, scientific and technological, health, and athletic purpose, the term is 50 years while if it is used for residential purpose, the term is 70 years.

According to Zhang and Masons (2007), land use rights are distinct and separate from land ownership. The land use rights are property rights enjoyed by private parties and protected by law. However, compared with leasehold, it has significant restrictions and limitations, particularly when it comes to the use of the land. In addition, having land use rights does not include with it the right to use the natural resources, minerals or treasure under the land. There is no central land registry for the registration and public search of the rights, but; there are county-level land registration departments, normally part of the local land administration authorities. Their responsibilities include handling the registration of the land-related rights and issuing what is called the 'certificate of land use right for state-owned land'.

Generally, there are three types of land use rights that apply in the case of land use in China: 'granted', 'allocated' and 'tenant' land use rights. They are different in how long they last, how they can be acquired and how much they can be acquired for, and how they can be marketed. Our interest is in land use rights awarded to rural citizens at birth by the village committee as established under the household responsibility system of the post Mao reform period.

Granted land use rights (GLUR) is the most common way to acquire land use rights from the state in return for a fixed fee. The state, as the owner of the land and represented by the local land administration authority, can grant companies, organizations or individuals within or outside China the exclusive right to use the land for a defined period. The maximum period of the GLUR depends upon the proposed use of the land such as forty years for commercial,

tourism and entertainment use; fifty years for industry, education, science, technology, culture, health and sports use; and seventy years for residential use.

An application to extend the GLUR must be made no later than one year before its expiry. When the parties renew the contract, another fee becomes payable. In cases where the GLUR is not renewed, all buildings, fixtures, structures and improvements over the land are taken back by the state without payment of compensation. A private party can enter into land use rights grant contract with the state by auction, tender or negotiation. However, the most common way is open competition, i.e. auction, tender or listing on the land use rights exchange market. If the proposed project is for a commercial purpose, it is compulsory to go through the open competition.

GLUR is marketable. Generally the GLUR can be transferred, let or mortgaged to other private parties without having first to get approval from the authorities. If the right is transferred, the duration will be the remaining years in the original land use right grant contract. If it is let, the conditions will be those that the original holder has developed and used the land in accordance with the land use rights grant contract. In addition the original holder will retain liability for the performance of the land use rights grant contract after letting the GLUR.

In addition, GLUR can be mortgaged. If there is no building or other fixed structure over the land, the mortgage of the GLUR must be registered with the land administration authority which issued the certificate. If there is a building or structure, these must be mortgaged together with the land. The mortgage must then be registered with the registration department indicated by the county level government (normally the land administration authority or the housing administration authority). The mortgage contract will only come into effect from the time of registration.

The GLUR can be terminated before the end of the due period in certain cases, usually when the state has decreed that the land is to be used for the public benefit or if the land is to be redeveloped. The state pays compensation if this happens.

Allocated land use rights (ALUR) is the right allocated by the state for an indefinite period and no fee is payable. The rights holder will be involved in land for governmental use, military use, urban infrastructure projects and facilities for public interest, energy, transportation or irrigation infrastructure projects. The Ministry of Land and Resources has published a catalogue of the detailed types of permitted use of land for allocated land use rights. The law does not expressly prohibit foreign companies or individuals from getting allocated land use rights. However, this is rarely done because of the restrictions on use.

The marketability of ALUR is restricted as it can only be transferred, let or mortgaged in certain situations. The general conditions and requirements for the ALUR to be transferred, let or mortgaged are: the approval by the land administration authority must be obtained; the holder of ALUR must be a company, enterprise, or other commercial organizations or individual; the holder of ALUR has obtained a certificate of land use right for state-owned land; the legal ownership certificate for the building or structure over the land has been properly obtained; and the parties must enter into a land use right grant contract and the land use right grant fee must be paid.

ALUR should only be taken in certain closely considered circumstances, where the business or individual obtaining that right is absolutely certain that this is really what they want. It will be difficult to dispose of so parties involved in a property transaction that incorporates ALUR must be absolutely certain that the transaction will get the approval of the land administration authority. Therefore, the market value of properties involving ALUR is

significantly lower than property involving GLUR.

Tenant land use rights A private party which includes any non-government entities may also obtain a tenant land use right, which basically means paying rent rather than buying the right for a one-off payment. This type of land use right is also time-constrained and is usually for a shorter term than the GLUR. It can be assigned, sub-let or mortgaged to a third party following land administration authority's consent.

2.4 Methods and Data

As far as we are aware there are no estimates of how much farmers would be willing to buy or sell land use rights should they be given the opportunity. Consequently we examine the problem from different empirical angles using three, related yet independent, approaches.

First, we specifically asked farmers the hypothetical 'if the government made it legal for farmers to buy or sell land use rights, would you buy or sell land use rights?'; 'If you were to sell your land use rights today, what is the minimum amount you would be willing to receive for the land use rights?'; 'If you were to buy a land use rights today, what is the maximum amount you would be willing to pay for the land use rights?' For the remainder of the study, these questions are called "self-declare questions".

Second, a specifically designed 'experiment' to evaluate farmers' willingness to buy and willingness to sell for land use rights of 15 scenarios is included in our survey. We apply the multiple bounded discrete choice (MBDC) elicitation technique where each scenario of land use rights value, the respondent is given a polychotomous choice response option, using a 5 level scale from "Definitely Buy", "Might Buy", "Neither Buy nor Sell", "Might Sell" to "Definitely Sell" value. Each scenario indicates different value of land use rights ranging from 20,000 RMB

to 300,000 RMB, with the amortized payment based on a 10 year time horizon. This technique is described later in the multiple bounded discrete choice approach section.

The first and second represent technical approaches to determine price break points between buyers and sellers to determine willingness to buy (WTB) and willingness to sell (WTS). The third component is more analytical in an attempt to categorize likely buyers and likely sellers and determine using multivariate regressions factors that affect these preferences.

Survey and data

The household survey was conducted in Shaanxi province in November 2010 with 730 respondents. Each household was interviewed by either one or two graduate students from Northwest Agriculture and Forestry University. The survey itself dealt exclusively with transaction of land use rights and other issues including farm credit, risk perception and entrepreneurship. In order to identify the willingness to buy and willingness to sell for land use rights, two broad types of questions were included in the survey.

Selected demographic and characteristics of respondent households are reported in Table 2.1. The average age of respondents is approximately 49 years old and the average education level of respondents is between attending middle school and completing middle school. On average there are about 5 people living in each household. The average number of years farming is 28 years, and the average farm size is 5mu (about 5/6th of an acre). Household income average is 23,796 RMB/year with approximately 39% of household income coming from farm activities. The average profit per year earned from cropped land is 953 RMB/mu. The average asset per household is 318,904 RMB. There are 203 farmers indicating the amount of their debt and the average debt per household is 29,330 RMB.

Table 2.1: Descriptive statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
Sex (Female =1)	730	0.5452	0.4983	0	1
Age	730	48.7200	11.3610	18	78
Education	730	4.3712	1.8364	0	8
Household member	730	4.8800	1.5120	2	18
Years of Farming	726	27.6653	13.5471	0	65
Farm Size (mu)	728	4.9302	2.8183	0	40
Household Income (RMB)	721	23,796.44	23,048.36	0	248,000
Percentage farm Income	720	0.3930	0.2933	0	1
Asset Value (RMB)	703	318,904.4	1,897,610	0	50,000,000
Farm Profit (RMB)	710	952.7394	1,915.0540	0	25,000
Amount of Debt (RMB)	203	29,329.6014	58,190.0110	0.01	600000

2.5 Multiple Bounded Discrete Choice Approach

In this section, we want to examine how participants respond to each land use rights value in order to reveal their willingness to buy (WTB) and willingness to sell (WTS). We apply a multiple bounded discrete choice (MBDC) elicitation technique introduced by Welsh and Poe (1998) that allows respondents to express their level of voting certainty for a wide range of referendum thresholds. In our case the referendum thresholds are land use rights values. At each land use rights value, the respondent is given a polychotomous choice response option, using a 5 level scale from “Definitely Buy”, “Might Buy”, “Neither Buy nor Sell”, “Might Sell” to “Definitely Sell”.

An example of multiple bounded question format is provided in Table 2.2. The MBDC questions consist of series of 15 land use rights value thresholds ranging from 20,000 RMB to 300,000 RMB. This response format allows the contingent valuation respondent to indicate the certainty of WTB and WTS at the different given prices of land use rights. When the land use rights value threshold is very high, the respondent might be very certain of selling the land use

rights. Similarly, when the values fall at or below the maximum WTB values, then the respondent may be very certain that he would buy land use rights.

Table 2.2: Multiple bounded question format
Question: Suppose that you had the opportunity to either buy or sell your land use rights, would you buy or sell your land use rights at the following value of land use rights?

		If Buy	If Sell	You would				
Scenario	**LUR Value (RMB)**	**Borrow and must pay this amount for 10 years**	**Receive sell amount and receive investment income of 10%/year**	**definitely buy**	**might buy**	**neither buy nor sell**	**might sell**	**definitely sell**
1	300,000	44,709	30,000					
2	150,000	22,354	15,000					
3	100,000	14,903	10,000					
4	75,000	11,177	7,500					
5	60,000	8,942	6,000					
6	50,000	7,451	5,000					
7	42,857	6,387	4,286					
8	37,500	5,589	3,750					
9	33,333	4,968	3,333					
10	30,000	4,471	3,000					
11	27,273	4,064	2,727					
12	25,000	3,726	2,500					
13	23,077	3,439	2,308					
14	21,429	3,193	2,143					
15	20,000	2,981	2,000					

Table 2.3 also provides the percentages of respondents that would buy or sell at the stated price. The second column contains the referendum land use rights value thresholds. The last five columns provide the distribution of MBDC responses for each threshold. The distribution responses follow expected patterns. The proportion of “Definitely Buy” and “Might Buy” responses generally increase but the proportion of “Definitely Sell” and “Might Sell” responses

decline as threshold values decrease. The results show, as anticipated, that as the price falls farm households migrate from sellers to buyers.

Table 2.3: Actual response distributions

		If Buy	If Sell	You would				
Scenario	**LUR Value (RMB)**	**Borrow and must pay this amount for 10 years**	**Receive sell amount and receive investment income of 10%/year**	**definitely buy (%)**	**might buy (%)**	**neither buy nor sell (%)**	**might sell (%)**	**definitely sell (%)**
1	300,000	44,709	30,000	**2.2**	**1.4**	**30.3**	**12.2**	**53.9**
2	150,000	22,354	15,000	**2.2**	**2.6**	**40.5**	**13.6**	**41.1**
3	100,000	14,903	10,000	**3**	**3**	**47.9**	**13.8**	**32.2**
4	75,000	11,177	7,500	**3.5**	**3.7**	**59.3**	**13.1**	**20.3**
5	60,000	8,942	6,000	**3.7**	**4.3**	**63.7**	**10.9**	**17.3**
6	50,000	7,451	5,000	**4.7**	**5.5**	**66.1**	**10.4**	**13.3**
7	42,857	6,387	4,286	**5**	**7.3**	**68**	**9**	**10.7**
8	37,500	5,589	3,750	**6.4**	**8.7**	**67.8**	**7.7**	**9.4**
9	33,333	4,968	3,333	**7.3**	**9.3**	**67.5**	**6.6**	**9.3**
10	30,000	4,471	3,000	**8.3**	**12.3**	**65.9**	**5.1**	**8.3**
11	27,273	4,064	2,727	**11.1**	**14.8**	**62.4**	**4.2**	**7.5**
12	25,000	3,726	2,500	**14.1**	**15**	**60.6**	**4**	**6.1**
13	23,077	3,439	2,308	**16.1**	**16.9**	**58.5**	**3.1**	**5.4**
14	21,429	3,193	2,143	**19.7**	**16.9**	**54.9**	**3.2**	**5.3**
15	20,000	2,981	2,000	**23.7**	**15.7**	**52.3**	**3.1**	**5.3**

% sum to 100 within rows

The MBDC allows contingent valuation respondents to express their certainty that they would buy or sell to provide the contingent valuation good for a range of dollar thresholds. Analysis of WTB and WTS data collected using the MBDC technique is conducted using a logit model. The purpose of applying a logit model is to estimate the probability of WTB and WTS response patterns associated with land use rights values. Estimation of "Definitely Buy", "Might Buy", "Neither Buy nor Sell", "Might Sell" and "Definitely Sell" MBDC switching functions

use the bounded-likelihood function in equation (2.1);

$$\ln(L) = \sum_{i=1}^{n} \ln [F(X_{iU}; \beta) - F(X_{iL}; \beta)] \quad (2.1)$$

where X_{iL} is the maximum land use right value threshold that the *i*th individual would be willing to buy, and X_{iU} is the lowest value threshold that the *i*th individual would be willing to sell. Let $F(X_i; \beta)$ denote a statistical distribution function for WTB_i and WTS_i with parameter vector β and X is a specific land use right value. The standard logistic function for the cumulative distribution function presents in equation (2.2)

$$F(X; \beta) = \frac{1}{1 + e^{-(\alpha + \beta X)}} \quad (2.2)$$

Table 2.4 presents the estimated logit model. The estimated constant Alpha (α) and slope Beta (β)coefficeints are significant at 1% level. The estimated Beta (β) coefficeints of "Definitely Buy", "Might Buy", Neither Buy nor Sell" responses are -0.0000167, -0.0000173, and -0.00000519 respectively. These values indicate that the estimated probability of "Definitely Buy", "Might Buy", Neither Buy nor Sell" responses significantly decrease as the land use rights values increase. Conversely, estimated Beta (β) coefficeints of "Might Sell" and "Definitely Sell" responses are positive with the values of 0.00000378 and 0.0000103 respectively. Therefore, the estimated probability of "Might Sell" and "Definitely Sell" responses significantly increase as the land use rights values increase.

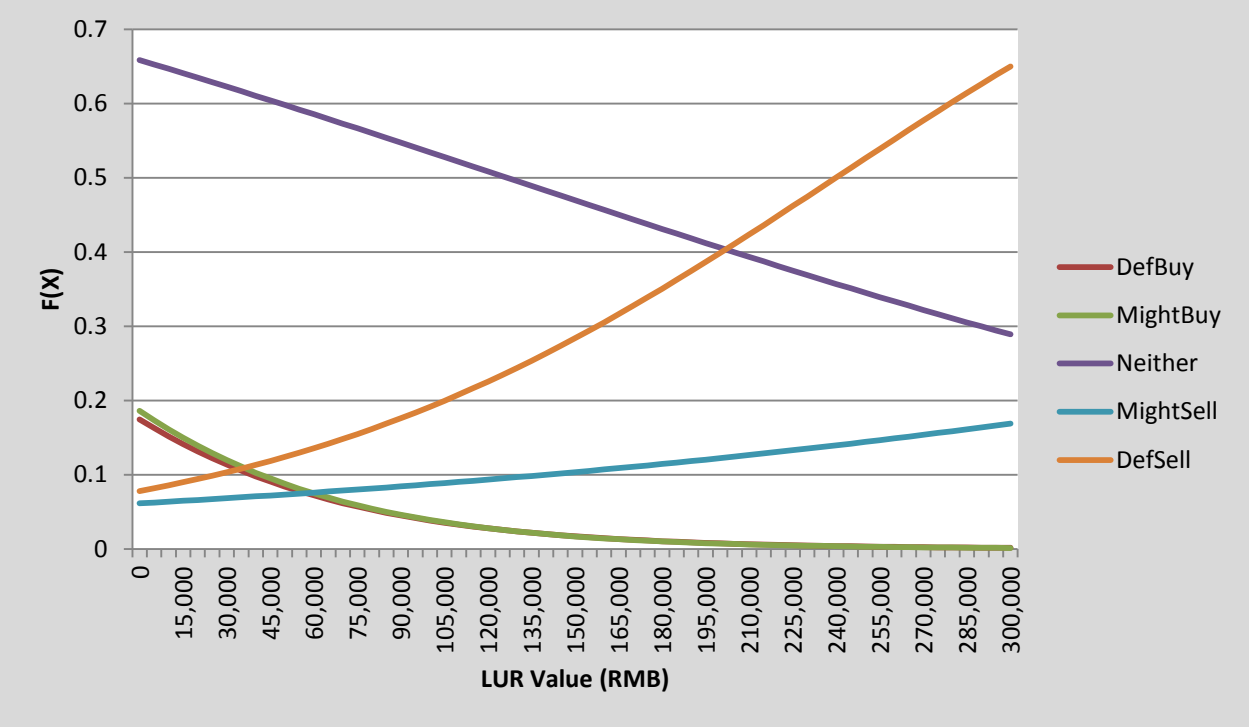
Table 2.4: Esimated logit model

	Alpha	**Standard Error**	**Beta**	**Standard Error**
Definitely Buy	-1.554061***	0.0636733	-0.0000167***	1.41E-06
Might Buy	-1.4771***	0.0629797	-0.0000173***	1.41E-06
Neither	0.6563912***	0.0273467	-0.00000519***	2.91E-07
Might Sell	-2.727078***	0.0491264	0.00000378***	3.95E-07
Definitely Sell	-2.471121***	0.0398994	0.0000103***	3.12E-07

*** Denotes 1% significance level.

The corresponding logit models are graphically depicted in Figure 2.1. The graphical depiction indicates that there is a close correspondence between “Definitely Buy” and “Might Buy”. The estimated probability of “Definitely Buy” and “Might Buy” responses decline as the land use rights values increase. Similarly, the “Neither Buy nor Sell” curve has a negative slope implying that the estimated probability of “Neither Buy nor Sell” falls as the land use rights values increase. In contrast, the probability of “Might Sell” and “Definitely Sell” responses rise as the land use rights values increase. The gap between “Might Sell” and “Definitely Sell” increases as the land use rights value thresholds increase. This indicates that when land use rights values are very high, respondents are more likely to sell.

Figure 2.1: Estimated logit distribution



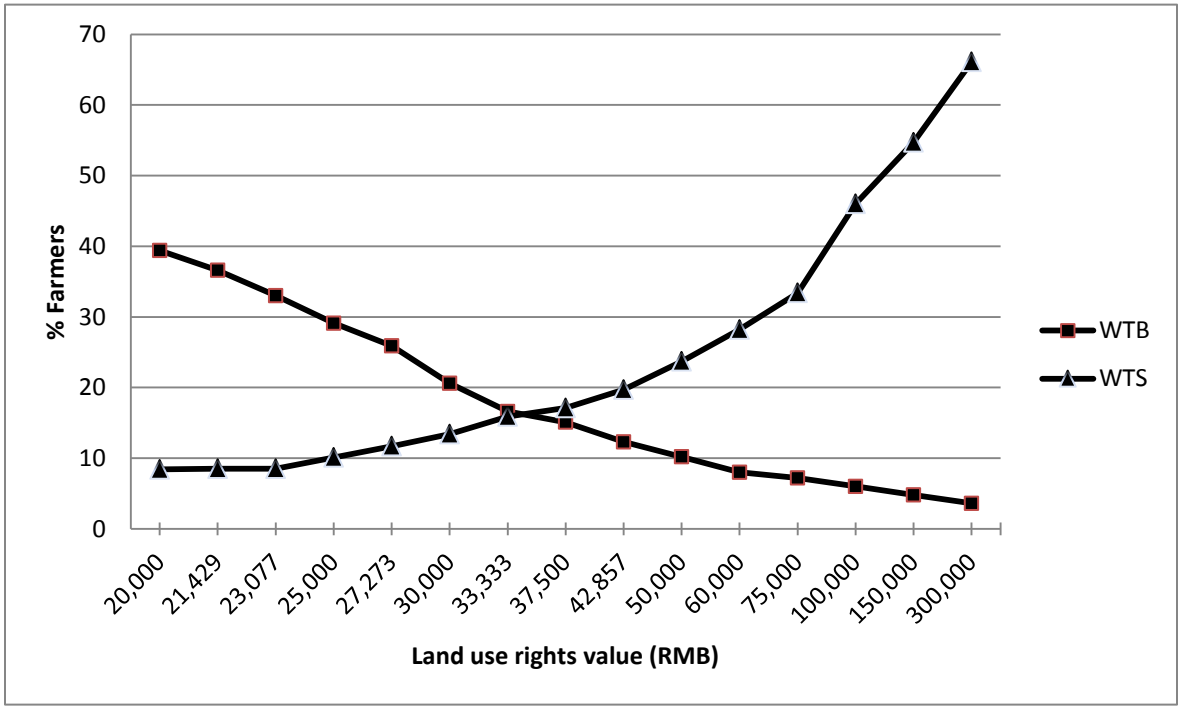
2.6 The Market of Land Use Rights

In a perfectly competitive market, the opportunity cost of an item would be its price, which is equal to the marginal value product of the item. If a non-traded item is bought and sold in a relatively competitive market, the market price is the measure of the willingness to pay and is generally the best estimate of an opportunity cost. Since, neither a transaction of land use rights nor the market of land use rights exists in China; we can generally accept the market price directly as our estimate of the economic value of land use rights.

In this section, we examine the market structure of land use rights; that is "If land use rights are transactable, what does the market look like?". We investigate the demand, supply and 'equilibrium' values of land use rights using the results summarized in Table 2.3. The response

distributions representing aggregate demand and supply curves are illustrated in Figure 2.2. Figure 2.2 depicts the willingness to buy and the willingness to sell of land use rights. The demand curve is represented by the percentage of farmers who would definitely buy or might buy land use rights, whereas; the supply curve is represented by percentage of farmers who would definitely sell or might sell land use rights. Diagrammatically, market equilibrium occurs where the demand and supply curves intersect. This equilibrium is defined by the price at which the percentage of farmers willing to buy equals the percentage of farmers willing to sell land use rights.

Figure 2.2: Demand and Supply of Land Use Rights



We assume that demand and supply are each represented by a power function:

$$Y = aX^b \tag{2.3}$$

where Y is percentage of farmers, X is land use rights value, a and b are parameters. With the power function the variable base X is raised to a fixed power b. A parameter a is a scalar which simply moves the values of X^b up or down.

Note that if b is positive and non-zero, the function passes through the origin. If the power b equals 1 then the relationship of Y and X is linear. However, for all other values the function is non-linear and its gradient varies. Now, take the natural logarithm on both sides of equation (2.3) we have:

$$lnY = lna + blnX \tag{2.4}$$

This is the linear transformation which is comparable to a single linear regression model:

$$Q = \alpha + \beta P + \varepsilon \tag{2.5}$$

where Q is a lnY vector, P is a lnX vector of regressor. $\alpha = lna$, and $\beta = b$ which are unknown parameters. ε is unobserved random variable which account for the discrepancy between the actually observed responses and the predicted outcomes. Assume further that the assumptions of classical linear regression model hold. Table 2.5 reports OLS regression to characterize demand and supply function of land use rights.

Table 2.5: Power function linear transformation: OLS regression results

	ln(Y) demand		**ln(Y) supply**	
	Coefficient	**P>t**	**Coefficient**	**P>t**
ln(X)	-0.952***	0	0.8623***	0
Constant α	12.86682***	0	-6.313195***	0
R-squared	0.9229		0.9456	

Note: *p<0.1; **p<0.05; ***p<0.01

Independent variables, lnX in both demand and supply equations are statistically significant at 1% level. The coefficient of lnX or b is negative for the demand function and positive for the supply function. Take the exponential of α, we can recover the value of a; $e^{\alpha} = a$.

The estimated aggregate demand or willingness to buy land use rights is

$$\boldsymbol{Y_d = 387248X^{-0.952}} \tag{2.6}$$

And the estimated aggregate supply or willingness to sell land use rights is

$$\boldsymbol{Y_s = 0.0018X^{0.8623}} \tag{2.7}$$

Equating the estimated demand and supply equations we obtain the estimated market equilibrium. The equilibrium price of LUR is **39,156 RMB.** At this price **16.43%** of farmers would be willing to sell their land use rights while 16.43% of farmers would be willing buyers. Approximately 67% of farmers would not transact even at this price.

Constant elasticity of power function

The price elasticity varies along most demand and supply curves. Along a special type of demand or supply curve, however, the price elasticity is the same at every point along the curve. Consider the demand and supply power function; $Y = aX^b$,

where *a* is a positive constant, *b* is the constant elasticity of demand or supply function, the land use rights value is raised to the *b* power, and holding income and other factors constant. Differentiating this expression with respect to land use rights value (price), we find that $dY/dX = abX^{b-1}$. Thus, the elasticity of demand, $(dY/dX)(X/Y)$, is

$$(abX^{b-1})(X/Y) = abX^b/aX^b = b \quad (2.8)$$

This derivation holds for any land use rights value; hence the elasticity of demand and supply is constant at every point along this type of power function curve.

According to the estimated demand and supply function in (2.6) and (2.7), The price elasticity of demand is -0.952 which means that a 1% decrease (increase) in the value of land use rights would increase the % of farmers willing to buy land use rights by 0.952%. Likewise, the price elasticity of supply of 0.8623 implies that a 1% decrease (increase) in the value of land use rights would decrease (increase) the % of farmers who are willing to sell land use rights by 0.8623%. The demand and supply for land use rights is relatively *inelastic* as both values of elasticity are less than one (in absolute value): that is, changes in land use rights value have a relatively small effect on the changes in percentage of farmers willing to buy and sell land use rights.

2.7 Contingent Valuation Method

In this section, we pursue further estimates of farmers' average value of WTB and WTS land use rights by applying the contingent valuation method (CVM) using the Multiple Bounded Discrete Choice Approach. CVM can estimate money values to non-use values; values that do not actually involve market purchases. We design two survey options for estimating the value of land use rights; first, farmers answer a self-declarative question and second, farmers responded to a polychotomous choice response question. In the self-declare questions, we asked "If the government made it legal for farmers to buy or sell land use rights, would you buy or sell land use rights?". We further asked a potential buyer "If you were to buy a land use rights today, what is the maximum amount you would be willing to pay for the land use rights?" and for a

potential seller “If you were to sell your land use rights today, what is the minimum amount you would be willing to receive for the land use rights?”. The values that potential buyers and sellers indicate in the self-declare questions are self-declared WTB and WTS values.

The polychotomous choice response option, as presented in Table 2.3, is a multiple bounded question format with 15 scenarios with land use rights ranging in value from 20,000 RMB to 300,000 RMB. The way to identify WTB and WTS values of land use rights are as follows: The maximum WTB value for each individual is the highest value of land use rights that a respondent indicated he would “Definitely buy” or “Might buy”. The minimum WTS value for each individual is the lowest value of land use rights that a respondent indicate he would “Definitely sell” or “Might sell”. A respondent who identified that he would neither buy nor sell at every land use right value in all 15 scenarios is not assigned a value since this would indicate non-participation at any price. Table 2.6 illustrates the responses for 10 respondents. Summary statistics for the CVM are reported in Table 2.7.

Table 2.6: The example of WTB and WTS value assignment of a polychotomous choice response

	Respondents									
LUR Value	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
300,000	5	3	1	5	4	5	5	2	5	5
150,000	5	3	1	5	4	5	5	2	5	5
100,000	3	3	1	5	3	5	5	2	3	4
75,000	3	3	1	5	3	3	5	2	3	1
60,000	3	3	1	5	3	3	5	2	3	1
50,000	3	3	1	5	3	3	5	2	3	1
42,857	3	3	1	5	2	3	5	2	3	1
37,500	3	3	1	5	2	3	5	2	3	1
33,333	3	3	1	5	2	3	5	2	3	1
30,000	3	3	1	5	2	3	4	2	3	1
27,273	3	3	1	5	2	3	4	2	3	1
25,000	3	3	1	5	1	3	3	2	3	1
23,077	2	3	1	5	1	3	3	2	3	1
21,429	2	3	1	5	1	3	3	2	3	1
20,000	2	3	1	5	1	3	3	2	3	1
Maximum WTB	23,077	-	300,000	-	42,857	-	-	300,000	-	75,000
Minimum WTS	150,000	-	-	20,000	150,000	100,000	27,273	-	150,000	100,000

Note: code 1 = definitely buy, 2 = might buy, 3 = neither buy nor sell, 4 = might sell, 5 = definitely sell

Using this approach we define the Maximum WTB and Minimum WTS. In the Tobit regressions to follow the dependent variables are made up from these values. For example the dependent variable value recorded to respondent A for the WTB Tobit regression is 23,077 RMB and for the WTS Tobit regression it is 150,000 RMB. For respondent J the respective values for WTB and WTS are 75,000 and 100,000 RMB. Respondent B indicated neither buy nor sell at any price and was excluded from both Tobit models. Respondent C indicated a willingness to purchase at any price, with no willingness to sell and was therefore excluded from the WTS Tobit, but included in the WTB with a value of 300,000 RMB. In contrast respondent D indicated a willingness to sell at any price and was included in the WTS Tobit but excluded from the WTB Tobit.

Table 2.7: Summary statistics for the CVM

Variable	Obs	Mean	Std. Dev.	Min	Max
Self-declare Max WTB	227	**24,571.67**	55,367.89	40	600,000
Self-declare Min WTS	207	**71,748.65**	98,964.47	0	600,000
Polychotomous choice Max WTB	295	**58,443.16**	72,845.45	20,000	300,000
Polychotomous choice Min WTS	491	**110,857.50**	94,299.85	20,000	300,000

We do not believe that land per mu, about 1/6th of an acre, will transact at anywhere near, let alone above 24,000 RMB. What the results actually indicate is that the spread between the price at which potential sellers will sell or potential buyers will buy are nowhere close. The suggested equilibrium is where the numbers of buyers equals the number of sellers, but this is not to say that this is the current equilibrium or whether such an equilibrium will actually arise in the near future. In fact the results suggest the opposite; that in the near term there are not enough buyers (at a price of 24,000 RMB) to satisfy the price at which buyers would sell (at a price of 72,000 RMB). These results indicate that at the present there is a significant excess demand for land use rights.

To determine the contingent values of WTB and WTS land use rights in self-declare questions, we use Ordinary Least Squares (OLS) in regression analysis. On the other hand, since the land use rights values in polychotomous choice with 15 scenarios are upper bounded at 300,000 RMB and lower bounded at 20,000 RMB, the CVM studies of polychotomous choice maximum WTB and minimum WTS have treated the value of land use rights as if they were censored at 300,000 and 20,000, and estimated subsequent WTB and WTS functions using Tobit Model.

The Tobit Model

The Tobit model identifies characteristics of farmers that determine WTB and WTS for the land use rights. Based on Cho et al. (2005) and Greene (2011), the Tobit model can be generally expressed:

$$Z_i = X_i\beta + u_i \qquad X_i\beta + u_i > 0 \tag{2.9}$$

where for the *i*th household, Z_i is vector of WTB or WTS depending on *i*th is a buyer or seller of land use rights, X_i is a vector of explanatory variables, u_i is a random disturbance term, and β is a parameter vector common to all households. Assuming the random error is independent and normally distributed across respondents, the expected WTB or expected WTS for an observation drawn at random is:

$$E(Z) = \Phi(X\beta/\sigma)X\beta + \sigma\phi(X\beta/\sigma) \tag{2.10}$$

where Φ represents the normal distribution function, ϕ represents the normal density function, and σ represents the standard deviation. The expected value of WTB and WTS for observations above zero, here called $E(Z^*)$ is simply $X\beta$ plus the expected value of the truncated normal error terms, see Amemiya (1973). Then, the expected WTB and WTS can be expressed as:

$$E(Z) = \Phi(X\beta/\sigma)E(Z^*) \tag{2.11}$$

The decomposition of this marginal effect that is obtained by considering the effect of a change in the *i*th variable of *X* on *Z*, see McDonald et al. (1980):

$$\partial E(Z)/\partial X_i = \Phi(X\beta/\sigma)(\partial E(Z^*)/\partial X_i) + E(Z^*)(\partial \Phi(X\beta\ /\ \sigma)/\ \partial Xi\ ) \qquad (2.12)$$

The total change in *Z* can be disaggregated into two parts. First, the change in *Z* of the above zero value is weighted by the probability of being above the zero. Second, the change in the probability of being above the zero value is weighted by the expected value of *Z* if above the zero. Equation (2.11) can be evaluated at the mean of the *Xs*, $\bar{X}$ with estimates of β and σ. The fraction of the total marginal effect due to the effect above the zero value of land use rights is

$$\partial E(Z^*)/\partial X_i = 1 - X\beta\phi(X\beta\ /\ \sigma)/\ \Phi(X\beta\ /\ \sigma) - \phi(X\beta/\sigma)^2/\Phi(X\beta/\sigma)^2 \qquad (2.13)$$

2.8 Determinants of Farmland Value and Regressors

Factors affecting farmland values have significant implications for the opportunity cost of agricultural production as farmland is the major asset in the agricultural balance sheet. Changes in farmland values imply changes in farmer's wealth which may influence the well-being of farm households. Previous literature has identified a number of possible factors associated with land value. For instance, Breffle et al. (1998) suggest that willingness to pay to preserve underdeveloped urban land is a function of income, household characteristics and location. Like other goods, important determinants of land values are those factors that affect supply, the amount of land offered to the market; and demand, the amount of land desired from the market.

According to Gloy et al. (2011), there are several factors that affect the demand and supply, and thus price of farmland. The major drivers of farmland demand are farm income, the capitalization rate, development potential, and return on farmland investment compared to other investment. The higher net income resulting from higher productivity, higher product prices, or

lower cost of production would lead to the higher land value. Furthermore, a higher capitalization rate resulting from higher interest rates, higher risk premiums or lower expected rates of growth in income will result in lower land values. In addition, land plot with high development potential and high investment return would cause a higher land values.

Farmland's price also depends upon the supply offered to the market. Offerings to the market depend significantly on the demographic such as age and investment behaviors of landowners. Further, the current financial position and the returns on alternative investments are also influence land value. If farmland generates a higher return than alternative investments, it is less likely to be offered to the market, whereas a lower return on farmland compared to alternative investments would suggest more land offered to the market.

Based on the results reported by the prior studies, a number of important factors affecting the value of land use rights were reviewed. We also include other factors that were expected to correlate with WTB and WTS of land use rights.

Demographic factors: We include sex and education level as independent variables. Gender differences and education level might be associated with the WTB and WTS of land use rights. Several studies examine gender's effect on WTP for economic, social or environmental goods and services and suggest that male, education and economic status positively influence WTP (see also Dong et al. (2003) and Farreras et al. (2005)).

Farm attribute and production factors: Farm attribute such as years of farming, farm size and farm rent dummy are included in the regression. O.I. (2008) examines the factors determining farmers' willingness to pay for agricultural extension services in Oyo state, Nigeria. Economic impact studies on agricultural extension have shown positive effect of extension on technology adoption, farm productivity and farm profits. The author finds that male farmers,

with longer farming experience and high proportion of crops sold will lead to a decrease in the probability of willingness to pay for extension services. As the farm size increases, the probability of the willingness to pay for extension services also increases as farmers would tend to be commercial oriented due to large farm sizes. Similarly, land tenurial right is positively related to the willingness to pay for extension services. The rent on land would have constituted additional cost of production that discourages willingness to pay for extension services. Jin et al. (2009) study the impact of rental markets in China's nine most important agricultural provinces and find that the gains in allocative efficiency and productivity of land use that can be realized through rental markets increases of some 60%. These lead to improvements in tenants' welfare of some 25%, and even larger increases in landlords' income. In our analysis, farm rent dummy is a binary variable taking value 1 if respondents rent farmland, and 0 otherwise. In addition, farmers were asked the best crop value grown in their farmland. The production of corn, wheat, tomato and kiwi dummy variables are also included as regressors. Since, tomato and kiwi are high profit crops, farmers who mainly grow tomato or kiwi are expected to have high WTB or low WTS of land use rights.

Profitability factors: Previous literature suggested that farm income and expected return from farm investment are major factor of land value. (see also Gloy et al. (2011) and Breffle et al. (1998)). Salois et al. (2010) compare the effect of farm income and population growth on farmland values and suggest that changes in farmland values are more strongly associated with changes in the distribution of returns. Farm income seems to be the more predictive factor of farmland value in most of the farm regions. We include household income, percentage of income from farming and asset value in regression.

Debt, credit and liquidity factors: Farm real estate has served as collateral for farm

mortgages. In particular, secure property rights are important for collateralizing both formal and informal loans, Ferranti et al. (2005). The use of farmland as collateral for farm loans links the financial feasibility of many rural lenders to farmland values. We want to examine whether debt, credit and liquidity factor have a significant impact of WTB and WTS for land use rights, and thus land value. Therefore, the independent variables of formal borrowing, informal borrowing, saving, risk rationing and quantity rationing are taken into account in the analysis. Formal borrow variable takes value = 1 if respondents borrow money from formal lenders such as Rural Credit Cooperatives (RCC) or banks and takes value = 0 otherwise. In contrary, informal borrow variable takes value = 1 if respondents borrow money from friends or relatives and takes value = 0 otherwise Risk rationing and quantity rationing are dummy variables for risk rationed farmers and quantity rationed farmers, which are compared relative to price rationed farmers, see how to classify risk rationed, quantity rationed and price rationed individuals in Khantachavana et al. (2011).

Attitude toward risk factors: Previous studies suggest that the level of risk aversion and prudence are associated with WTB and WTS. Okada (2010) study the case of forward contracts and fixed-fee turnkey contracts and demonstrate that the discrepancy between the seller's willingness to accept (WTA) and buyer's willingness to pay (WTP) increases with the level of uncertainty about the exchange item's value and the exchange parties' level of risk aversion. Risk aversion is found to decrease the WTP while increase the WTA. However, high prudent farmers are expected to place relatively greater maximum WTB value of land use rights. Kimball (1991) finds that prudent individuals have precautionary saving motive that can cause them to respond to a risk by accumulating more wealth. Land is a valuable asset and a factor of production that can generate income for farm households. Hence, the precautionary demand can cause farmers to

respond to a risk by placing high maximum value of WTB and holding more farmland.

We include risk aversion score and prudence score as proxies of risk attitude in the regression. Risk aversion score is calculated based on farmers' willingness to take risk, risk management options use and perceptions. In the survey form farmers were asked to identify their willingness to accept greater production risks in order to increase the chance of higher profits, to take risks with new technologies, and to take risks with new management practices before seeing good results in other farms. In addition, farmers indicated how important of risk management in their farm. Risk management options that we asked include farm diversification, geographic diversification, irrigation, marketing diversification, forward contract, participation in government programs, maintaining financial reserves and investing off-farm for other sources of income. Prudence score is calculated based on the purposes of their precautionary savings. Farmers specified their level of agreement or disagreement on a five-level Likert scale for a series of statements; I save in case my automobile break down; I save for unexpected medical emergency; I save to protect job loss; and I save for unanticipated crop loss. The higher the score would indicate that the respondent is more risk averse and prudence.

Other variables of interest are as follow. First, Business climate variable is used to capture farmers' perception of macroeconomic environment. Business climate takes value = 1, 0 or -1 if respondents indicate that the current business climate for farmers in your area compared to last year is getting better, about the same, or getting worse, respectively. Second, "migrant farm labor" variable represents employment status of whether respondents or their spouse are migrant worker farm labors. Migrant labor is of interest because we expect that migrant labor would be more likely to sell their land use right and work in the city. Thus, their maximum WTB and minimum WTS are relatively low. Third, entrepreneurship factors consist of "ever started

business" and "plan to start business" variables. If a respondent has ever started business, then "ever started business" takes value =1 and 0 otherwise. "Plan to start business" variable is a dummy variable to account for farmers' entrepreneurial decision. It takes value 1 if respondents are planning to start a new business, and 0 otherwise. Forth, computer and internet variables are included to capture information access. If respondents have a computer at home, then "computer" variable takes value = 1 and 0 otherwise. If respondents have internet access from home, then "internet" variable takes value = 1 and 0 otherwise.

Next, political factors associated with WTB and WTS land use rights are considered in the study. Private ownership of land is not allowed under the Constitution, and rural land is still effectively controlled by township and village level leaders. Village leaders may also receive sizeable advantages through their control over the sale of village land for industrial development and other purposes, Brandt et al. (2002). Ravallion et al. (2008)[4] find that having a household member with a government job or a job in a state-owned enterprise tended to increase consumption efficient land allocation but reduce the administrative allocation which resulted in a higher efficient land allocation – suggestive of greater access to credit or productive inputs by households. In 2003, the China Rural Land Contract Law was implemented with the purposes to strengthen individual rights and limit the ability of village leaders to exercise unconstrained power. However, results from Deininger et al. (2006) support the notion that it would be naïve to assume that village leaders whose discretionary power may be reduced by such new legislation would be very eager to implement it. Moreover, Ding (2003) argue that land policy reforms in China have yielded positive impacts on urban land use as well as negative socioeconomic consequences such as government corruption, see also Liu et al. (1998). Therefore, we include

[4] The authors of the book "Land in Transition: Reform and Poverty in Rural Vietnam". Vietnam is the fast developing socialist economy in implementing market-based reforms which follow China's pattern.

variables representing whether household members work for village leader, village committee, state government, county government, state enterprise, and RCC or bank as regressors.

Finally, we include a binary variable to assess whether land located in villages within city limits affect WTB and WTS. According to the land valuation models of David Ricardo and Johann Heinrich von Thünen, the Ricardian rent is a decreasing function of the distance to the urban center. The von Thünen model also explains that land closer to the urban center is more valuable for conversion, given that farmland can be allocated to urban uses, Salois et al. (2010). Land location is represented by a "near city dummy" variable indicating whether the land is located within city boundary. We use Xi'an city as a point of reference and assign the value of city distance variable =1 for 12 villages closed to Xi'an and value = 0 for other 12 villages farther away from Xi'an.

2.9 Estimation of Land Value: Willingness to Buy and Sell Land Use Rights

The OLS are reported in Table 2.9 – 2.10 and Tobit regression results are reported in Table 2.11 – 2.12. In OLS (1) and Tobit (1) column, only major factors are included in a model, namely demographic, farm attribute and production, profitability, debt, credit and liquidity, and attitude toward risk factors. In OLS (2) and Tobit (2) column, other variables also included except a village fixed effect. The OLS (3) and Tobit (3) are complete models that include all factors of interest. We pay attention to OLS(3) and Tobit (3) models. The factors that increase the maximum WTB or minimum WTS would cause the higher land user rights value. In contrast, the factors that decrease the maximum WTB or minimum WTS would cause the smaller land user rights value.

Self-declare questions:

The maximum WTB and minimum WTS data obtained from self-declare questions are applied in the OLS analysis. The results suggest that farmers who grow tomato have a higher WTB land use rights. Though, tomato coefficient in OLS(3) is not significant but those in OLS (1) and OLS (2) are statistically significant at 10% level. This is because tomato farm makes higher profit to farmers. So, they would be willing to buy more land to grow tomato, and thus the value of land use rights would increase. Risk rationed and quantity rationed individuals would have higher WTB compared to price rationed individuals. Even though, risk rationed and quantity rationed farmers have liquidity constraint, they would be more likely to buy land use rights if they have enough money and can afford it. Risk rationed individual is a risk averse person who did not accept the approved loan because he is afraid of losing land as collateral. In this sense, if he is able to buy land use rights, his maximum WTB would be greater than that of other types of credit rationed individuals. This is consistent to previous literature finding that risk averse agents are more likely to hold assets. In addition, computer, village committee and near city dummy variables are positively related to WTB for land use rights. Since the impact of computer on WTB can also be considered as a wealth effect, farmers having a computer at home have high WTB and would be more willing to buy land use rights. Having family members work in a village committee would increase the WTB for land use rights because they are representative of farmers who may have insider information. Farmers living in village near a city are more willing to pay higher price for land use rights. These significant factors are expected to increase value of land use rights.

The results of the OLS model presented in Table 2.10 shows that farmers who grow tomato have high minimum WTS for land use rights. Therefore, if they sell land use rights, they

will sell at a high price. This could predict that they are less likely to sell land use rights and buy more land use rights because tomato is a high value crop. Furthermore, profitability factors are associated with WTS. The coefficients of household income, percentage of income from farming and asset value are positively related to WTS of land use rights. The relatively rich farmers or those who can generate high income from farming would sell land use rights at a high price because their marginal productivity of land is relatively high. Formal borrowing and land location near the city are inversely associated with WTS. Farmers who can access to a formal credit or who reside near the city have a low minimum WTS indicating that they are more likely to sell their land use rights. This may imply that formal borrowers also need money from their land use rights. Farmers whose land located near the city want to sell land use rights because they have more opportunity to work in the city. On the other hand, farmers who have ever stated business have high minimum WTS indicating that they are less likely to sell their land use rights. This is consistent to the crosstabulation results presented in Table 2.8 indicating that 48.4% of farmers who have ever started a new business would be more likely to remain the agriculture.

Table 2.8: Crosstabulation results

		you ever started a new business		
		No	Yes	Total
If I could get adequate credit as I needed from a bank or RCC, I would be more likely to	Leave agriculture and start a non-farm enterprise	24.1%	34.8%	28.3%
	Leave agriculture and work as off-farm labor	3.0%	8.2%	5.0%
	Remain in agriculture and expand agricultural production	39.4%	25.1%	33.8%
	Remain in agriculture and also start a non farm business	16.6%	23.3%	19.2%
	None of the above	16.9%	8.6%	13.6%
Total		100.0%	100.0%	100.0%

Polychotomous choice/ multiple bounded questions:

The tobit model results using data from polychotomous choice questions are shown in Table 2.11 and 2.12. Crop types grown by farmers are significant indicator of WTB. Results show that corn and wheat farmers have relatively small maximum WTB and would be more likely to sell land use rights because corn and wheat are not high profit crops compared to tomato and kiwi. Also, farmers having more saving or having internet access at home place relatively greater maximum WTB value of land use rights. Relatively rich farmers would be willing to pay for land use rights at higher price. This result is consistent with the result from self-declare questions in OLS model. Having internet access would increase the willing to buy land use rights because internet can provide more information about the land market. Furthermore, having family members working for state enterprise also increase maximum WTB, though the

coefficient is not statistically significant. This is consistent with Ravallion et al. (2008) finding. Business climate and computer factors are inversely related to WTB. This implies that if the economy is getting better, farmers would place a lower maximum WTB and would be less likely to buy land use rights. This could be because of the marginal substitution between working in-farm and off-farm. The economic boom would lead to an increase in employment opportunities and thus, farmers are encouraged to leave agriculture and work off-farm.

The minimum WTS for land use rights depends on several factors. First, female respondents place relatively greater maximum WTB value of land use rights. The similar results from Barclay's Wealth reported by Frank (2009) show that women also are more likely to enjoy investing in real estate than men. From the survey of 2,000 investors world-wide, 44% of women surveyed find buying property more enjoyable than investing in other asset classes. Second, percentage of income from farming and saving are found to be negatively correlated with WTS. This result contradicts with the result in the OLS model. The result in a tobit model suggests that relatively rich farmers tend to sell land use rights at low price and would be more likely to sell their land use rights implying that they want to exit farming. Third, farmers having internet access place a high minimum WTS for land use rights, so the land use rights value would increase. The result is consistent with the OLS model suggesting the increase in maximum WTB and value of land use rights. Finally, having family members work as a village leader or work in a county government would cause a decrease in minimum WTS. This suggests that having a secure job encourages workers to sell land use rights at low price.

Table 2.9: OLS regression results: self declare maximum WTB

Self-Declare Max WTB	OLS (1)		OLS (2)		OLS (3)	
	Coefficient	P>t	Coefficient	P>t	Coefficient	P>t
Sex (female = 1)	1989.856	0.823	7751.398	0.276	-873.7118	0.907
Education	4607.344	0.194	433.5559	0.859	-466.1842	0.847
Years of farming	66.78306	0.814	-101.5056	0.747	108.0724	0.73
Farm size (mu)	-481.7304	0.625	-209.6139	0.829	310.9898	0.752
Farm rent dummy	8490.814	0.438	112.5298	0.991	-5547.707	0.657
Corn	-2553.107	0.85	11831.41	0.371	15558.32	0.526
Wheat	-15892.17	0.119	3500.967	0.792	10691.57	0.619
Tomato	84016.81*	0.051	54689.43*	0.085	41023.04	0.103
Kiwi	-29959.62*	0.056	-23692.39	0.408	-28773.1	0.433
Household income	-0.209464	0.243	-0.0705865	0.61	-0.0840104	0.635
Percent income farming	10330.07	0.465	18262.16	0.176	10262.58	0.542
Asset value	0.0410925**	0.021	0.0376429***	0.008	0.0183803	0.182
Informal borrow	-10502.03	0.162	-5996.901	0.431	1660.976	0.861
Formal borrow	-34090.08*	0.073	-21378.33*	0.072	-16993.88	0.197
Saving	-7824.25	0.27	-1307.03	0.742	-1904.828	0.606
Risk Rationing	17340.59	0.365	23129.81	0.264	36662.7	0.103
Quantity Rationing	11730.4	0.257	19415.37*	0.099	19262.42	0.113
Risk aversion score	-105.7657	0.554	-131.8169	0.473	-157.5361	0.544
Prudence score	487.9448	0.145	272.2502	0.307	220.4291	0.483
Business Climate			4404.534	0.446	6451.253	0.211
Migrant farm labor			-10532.27	0.272	-11989.97	0.414
Ever started business			-542.2131	0.942	-297.8523	0.97
Plan to start business			-4161.853	0.577	7698.805	0.457
Computer			21525.97	0.399	42329.51*	0.098
Internet			-15045.37	0.557	-25289.08	0.317
Village leader			-15616.5	0.363	-10950.56	0.628
Village committee			27614.36	0.116	40014.61*	0.092
State government			-24397.42***	0.008	-12461.99	0.302
County government			639.0494	0.976	5289.759	0.839
State enterprise			-16631.18	0.183	-23404.5	0.104
RCC or bank			70.80949	0.997	-1872.605	0.94
Near city dummy			17594.27	0.115	56731.23*	0.078

(Continued) Self-Declare Max WTB	OLS (1)		OLS (2)		OLS (3)	
	Coefficient	P>t	Coefficient	P>t	Coefficient	P>t
bigong					20387.48	0.547
chenmayuan					-27294.38	0.592
datong					31178.73	0.305
han					24506.9	0.343
huangbao					-51666.78**	0.011
huangbu					27849.57	0.374
laoshang					-16579.13	0.533
laoxia					-35439.08	0.118
liaodi					20681.2	0.449
liaoshang					-24167.81	0.468
maying					(dropped)	
mengjiazhai					6094.83	0.87
pingxi					-30174.96	0.118
sihu					26242.23	0.388
taibai					64495.76	0.194
tangjia					-33564.62	0.236
xiaozhai					28516.3	0.339
xidazhai					-9369.849	0.808
xieshang					31531.52	0.689
xixiaozhai					22033.04	0.387
yindou					22553.81	0.504
zanfan					(dropped)	
zhaixi					-28341.78	0.432
Constant	7900.329	0.729	-9455.348	0.692	-40177.84	0.381
Observations	171		146		146	
Expected LUR Value	24967.97		23996.23		23551.34	

Note: *p<0.1; **p<0.05; ***p<0.01

Table 2.10: OLS regression results: self declare minimum WTS

Self-Declare Min WTS	OLS (1)		OLS (2)		OLS (3)	
	Coefficient	**P>t**	**Coefficient**	**P>t**	**Coefficient**	**P>t**
Sex (female = 1)	25983.39	0.139	48112.36**	0.031	16055.36	0.396
Education	7110.483	0.273	10294.51	0.121	5876.519	0.406
Years of farming	-270.1117	0.731	1085.719	0.188	61.67728	0.947
Farm size (mu)	601.6229	0.853	-1557.711	0.669	-4161.307	0.237
Farm rent dummy	33675	0.193	33684.12	0.129	22137.64	0.274
Corn	-11498.94	0.56	-16181.9	0.512	-13936.98	0.664
Wheat	4701.004	0.786	-3813.272	0.849	10268.99	0.691
Tomato	102400.6	0.238	140747.9**	0.037	172276.2**	0.022
Kiwi	-4507.4	0.851	28281.28	0.411	29368.72	0.431
Household income	-0.1998493	0.394	-0.0351235	0.875	0.2861343	0.153
Percent income farming	-898.7404	0.977	9435.284	0.769	66935.55*	0.055
Asset value	0.0689114**	0.024	0.0472253	0.112	0.0415075	0.139
Informal borrow	5070.179	0.763	-9322.856	0.64	606.8493	0.976
Formal borrow	-59970.48***	0.002	-73328.38***	0.002	-106519.4***	0
Saving	-2283.677	0.776	-9186.982	0.305	-3536.754	0.71
Risk Rationing	40046.4	0.401	42001.44	0.229	-7586.325	0.802
Quantity Rationing	2302.286	0.897	-10681.77	0.646	-9970.671	0.681
Risk aversion score	73.49729	0.87	287.0733	0.538	637.3785	0.313
Prudence score	938.7586*	0.051	499.6503	0.395	176.3827	0.762
Business Climate			5771.957	0.591	15364.04	0.185
Migrant farm labor			-132935.3*	0.082	-47912.03	0.332
Ever started business			34262.34*	0.085	43693.55**	0.028
Plan to start business			10214.45	0.589	-10264.1	0.614
Computer			1299.19	0.975	4584.232	0.905
Internet			-16175.46	0.713	22226.31	0.561
Village leader			100797.2**	0.049	16909.31	0.62
Village committee			-18148.62	0.72	38378.44	0.192
State government			50860.61	0.388	18074.28	0.652
County government			-26195.59	0.327	-20519.93	0.404
State enterprise			58520.13*	0.058	25462.65	0.388
RCC or bank			-42766.76	0.345	-9844.139	0.801
Near city dummy			-25982.04	0.179	-84575.37**	0.042

(Continued) Self-Declare Min WTS	OLS (1)		OLS (2)		OLS (3)	
	Coefficient	P>t	Coefficient	P>t	Coefficient	P>t
bigong					-31411.15	0.536
chenmayuan					(dropped)	
datong					-135053.1***	0.003
han					-43074.73	0.471
huangbao					(dropped)	
huangbu					(dropped)	
laoshang					-35529.5	0.501
laoxia					22273.51	0.626
liaodi					-50577.23	0.342
liaoshang					(dropped)	
maying					-44074.94	0.203
mengjiazhai					-13687.67	0.676
pingxi					(dropped)	
sihu					16891.82	0.789
taibai					-14117.44	0.69
tangjia					86403.17**	0.023
xiaozhai					-92888.4**	0.039
xidazhai					126982**	0.014
xieshang					-93004.25	0.155
xixiaozhai					72431.53*	0.075
yindou					-110469.9*	0.058
zanfan					408211.1***	0
zhaixi					6793.183	0.845
Constant	-40275.52	0.588	-76497.27	0.298	-6228.309	0.92
Observations	145		127		127	
Expected LUR Value	61958.93		64999.36		68642.95	

Note: *p<0.1; **p<0.05; ***p<0.01

Table 2.11: Tobit regression results: polychotomous choice maximum WTB

Polychotomous Max WTB	Tobit (1)		Tobit (2)		Tobit (3)	
	Coefficient	**P>t**	**Coefficient**	**P>t**	**Coefficient**	**P>t**
Sex (female = 1)	-11671.27	0.316	-9376.545	0.463	-8940.947	0.474
Education	-1607.546	0.641	-3049.735	0.43	-2037.732	0.566
Years of farming	-485.7963	0.333	-299.1931	0.605	-404.3269	0.457
Farm size (mu)	1185.205	0.612	2066.231	0.451	224.9394	0.936
Farm rent dummy	3376.125	0.794	3814.37	0.795	5141.855	0.723
Corn	-26139.35	0.155	-35216.93*	0.061	-66252.23***	0.002
Wheat	-18308.11	0.243	-25075.45	0.158	-51995.98***	0.007
Tomato	9353.765	0.719	-12260.7	0.655	16243.64	0.556
Kiwi	-52806.5	0.501	-59723.4	0.434	1978.255	0.978
Household income	0.0866004	0.728	0.1272882	0.638	0.1504057	0.57
Percent income farming	8943.175	0.702	21124.6	0.413	22765.24	0.375
Asset value	0.0100693	0.612	-0.0056808	0.782	-0.0117611	0.539
Informal borrow	-7729.877	0.558	3750.699	0.797	3112.923	0.831
Formal borrow	-13598.68	0.375	-10509.55	0.521	2498.246	0.874
Saving	2347.83	0.674	9294.504	0.159	9874.4	0.124
Risk Rationing	-506.0844	0.979	-7946.966	0.693	7387.559	0.718
Quantity Rationing	-9051.046	0.554	-7046.448	0.687	-186.8524	0.991
Risk aversion score	-287.8146	0.386	49.94674	0.895	211.3823	0.606
Prudence score	63.77366	0.853	-434.7502	0.32	-415.9749	0.325
Business Climate			-7436.495	0.397	-13670.73	0.117
Migrant farm labor			-21103.02	0.484	-7914.564	0.794
Ever started business			14333.85	0.236	6099.882	0.602
Plan to start business			-5167.986	0.719	-2067.971	0.883
Computer			-33315.89	0.223	-46871.92*	0.073
Internet			37006.47	0.212	58780.37**	0.038
Village leader			-23617.72	0.396	-25563.04	0.334
Village committee			5904.928	0.836	10944.99	0.683
State government			27650.58	0.334	25026.97	0.379
County government			12473.11	0.58	11617.41	0.588
State enterprise			32950.52*	0.054	26938.9	0.104
RCC or bank			33765.85	0.21	28171.05	0.258
Near city dummy			285.0204	0.984	63113.71	0.232

(Continued) Polychotomous Max WTB	Tobit (1)		Tobit (2)		Tobit (3)	
	Coefficient	P>t	Coefficient	P>t	Coefficient	P>t
bigong					-5545.159	0.92
chenmayuan					-4569.621	0.96
datong					38278.62	0.497
han					26273.11	0.638
huangbao					43003.08	0.245
huangbu					10618.02	0.85
laoshang					-36039.17	0.43
laoxia					-53994.85*	0.056
liaodi					-4248.712	0.946
liaoshang					12782.94	0.836
maying					-39559.65	0.558
mengjiazhai					-111728.3***	0.001
sihu					53558.46	0.329
taibai					36256.86	0.523
tangjia					-30859.04	0.241
xiaozhai					144295.9**	0.014
xidazhai					-76415.64	0.162
xieshang					-100673.6**	0.012
xixiaozhai					-74071.54***	0.009
yindou					-2459.849	0.969
zanfan					19408.1	0.819
zhaixi					-91640.75***	0.005
Constant	98518.36**	0.015	77354.64*	0.077	68291.54	0.231
Observations	219		189		189	
Log likelihood	-2604.4296		-2239.4288		-2215.3056	
Expected LUR Value	56889.15		55830.37		58881.91	

Note: *p<0.1; **p<0.05; ***p<0.01

Table 2.12: Tobit regression results: polychotomous choice minimum WTS

Polychotomous Min WTS	Tobit (1)		Tobit (2)		Tobit (3)	
	Coefficient	**P>t**	**Coefficient**	**P>t**	**Coefficient**	**P>t**
Sex (female = 1)	21003.86*	0.08	25305.2**	0.05	24838.26*	0.065
Education	3515.046	0.327	1715.039	0.658	2891.647	0.444
Years of farming	-194.0568	0.69	189.6762	0.731	330.2639	0.545
Farm size (mu)	6003.045**	0.016	6768.036**	0.017	2559.477	0.392
Farm rent dummy	-11997.05	0.375	-9178.823	0.538	-7336.322	0.625
Corn	4648.95	0.806	10052.77	0.606	-18856.9	0.397
Wheat	-12646.1	0.445	-18187.48	0.32	-27426.44	0.19
Tomato	278.3883	0.993	-153.364	0.996	26606.64	0.426
Kiwi	-32102.9	0.663	-80315.23	0.268	-39606.33	0.588
Household income	-0.2623357	0.305	-0.2776085	0.292	-0.3221649	0.212
Percent income farming	-38642.5*	0.092	-47524.02*	0.052	-47668.43*	0.058
Asset value	0.00495	0.804	0.0032725	0.876	0.0158354	0.458
Informal borrow	-19861.34	0.155	-20841.16	0.182	-20719.37	0.189
Formal borrow	-16366.33	0.336	-21866.89	0.21	-19400.04	0.277
Saving	-11828.3**	0.043	-16814.35**	0.015	-13368.55*	0.057
Risk Rationing	50002.75**	0.042	54413.41**	0.033	27967.26	0.299
Quantity Rationing	762.4771	0.962	-17679.76	0.319	-8136.323	0.646
Risk aversion score	-135.838	0.703	378.8171	0.344	440.8792	0.322
Prudence score	11.43919	0.974	167.5496	0.683	227.8748	0.586
Business Climate			10902.34	0.223	13726.25	0.131
Migrant farm labor			22860.02	0.499	21415.84	0.514
Ever started business			10376	0.409	6595.018	0.618
Plan to start business			671.8331	0.961	247.2213	0.986
Computer			-40116.67	0.216	-41290.07	0.2
Internet			76812.23**	0.026	85797.81**	0.012
Village leader			-47686.86	0.115	-59943.27**	0.048
Village committee			22650.71	0.433	18182.06	0.527
State government			33565.24	0.221	20797.5	0.457
County government			-66726.98***	0.007	-63602.89***	0.01
State enterprise			22736.81	0.27	26541.84	0.2
RCC or bank			52866.16	0.119	42665.54	0.2
Near city dummy			3113.88	0.832	57612.47	0.414

(Continued) Polychotomous Min WTS	Tobit (1)		Tobit (2)		Tobit (3)	
	Coefficient	P>t	Coefficient	P>t	Coefficient	P>t
bigong					33530.57	0.647
chenmayuan					54197.69	0.66
datong					82067.37	0.276
han					95162.05	0.194
huangbao					14694.36	0.706
huangbu					50221.81	0.51
laoshang					25498.21	0.494
laoxia					-5989.234	0.831
liaodi					63420.46	0.395
liaoshang					-27874.74	0.73
maying					-66625.67	0.474
mengjiazhai					-58203.02	0.154
pingxi					19414.88	0.837
sihu					42635.39	0.555
taibai					34127.15	0.643
tangjia					-43948.36	0.144
xiaozhai					-42420.42	0.575
xidazhai					53830.08	0.314
xieshang					-89679.4**	0.033
xixiaozhai					-77395.08**	0.022
yindou					15946.88	0.838
zanfan					97070.95	0.341
zhaixi					-1869.635	0.954
Constant	117781.8***	0.006	79308.02	0.101	45208.23	0.541
Observations	355		300		300	
Log likelihood	-4015.0717		-3361.8363		-3345.0615	
Expected LUR Value	99041.91		99414.4		96871.68	

Note: *p<0.1; **p<0.05; ***p<0.01

Summary of expected land use rights value by models are reported in Table 2.13. Compared to the equilibrium land use rights value of 39,156.13 RMB in a power function, we find the expected maximum WTB and minimum WTS from self-declare questions are 23,551.34 RMB and 68,642.95 RMB respectively. With the existence of land use rights market, the expected value of land use rights would probably be in between the value of 23,551.34 RMB and 68,642.95 RMB. However, the expected maximum WTB and minimum WTS from polychotomous choice format are found to be 58,881.91 RMB and 96,871.68 RMB respectively. These two values are greater than the equilibrium land use rights value of 39,156.13 RMB estimated in a power function. The expected value of land use rights from polychotomous choice would be in between the value of 58,881.91 RMB and 96,871.68 RMB. The expected value of land use rights derived from self-declare questions is lower than the expected value derived from polychotomous choice questions because of the format of the questions. This is consistent to the mean of WTB and WTS reported in Table 2.7, Summary statistics for the CVM. Compared between self-declare questions and polychotomous questions, respondents seem to reveal their WTB and WTS with certainty relatively small in self-declare questions. The values of WTB and WTS from zero to any positive amount are allowed in self-declare questions. The polychotomous choice or multiple bounded discrete choice questions on the other hand are bounded between 20,000 RMB and 300,000 RMB. As a result, we worry about the potential for the polychotomous choice technique to result in overestimates of mean WTB and WTS.

Table 2.13: Summary of expected land use rights value by models

Model	Expected LUR value (RMB)
Power function	39,156.13
Self-declare Max WTB	23,551.34
Self-declare Min WTS	68,642.95
Polychotomous choice Max WTB	58,881.91
Polychotomous choice Min WTS	96,871.68

2.10 Propensity to Buy or Sell Land Use Rights

In this section, we want to examine the characteristics as well as factors associated with potential buyers and sellers of land use rights. We first need to identify who are potential buyers and sellers of land use rights. To do so, we use data from the survey response in a multiple bounded question (polychotomous choice format) presented in Table 2.3. With the 15 scenarios, each individual farmer responded the questionnaire differently. Figure 2.3 shows the diagram of WTB and WTS for land use rights of selected farmers when land use rights value decreases from 300,000 RMB to 20,000 RMB. The Y-axis is the land use rights value and the X-axis is the WTB and WTS of land use rights where number 1 to 5 on the X-axis represents the response "definitely buy", "might buy", "neither buy nor sell", "might sell" and "definitely sell" respectively. Based on the data and the diagram, some farmers, for instance, the 2nd farmer would neither buy or nor sell land use rights for every land use rights value, while the 15th farmer would definitely sell land use rights for every value. Some farmers would definitely sell at the high value then switch to buy at the lower value. The switching point of land use rights value from selling to buying is different across all respondents.

Figure 2.3: the diagram of willingness to buy and sell land use rights of selected farmers

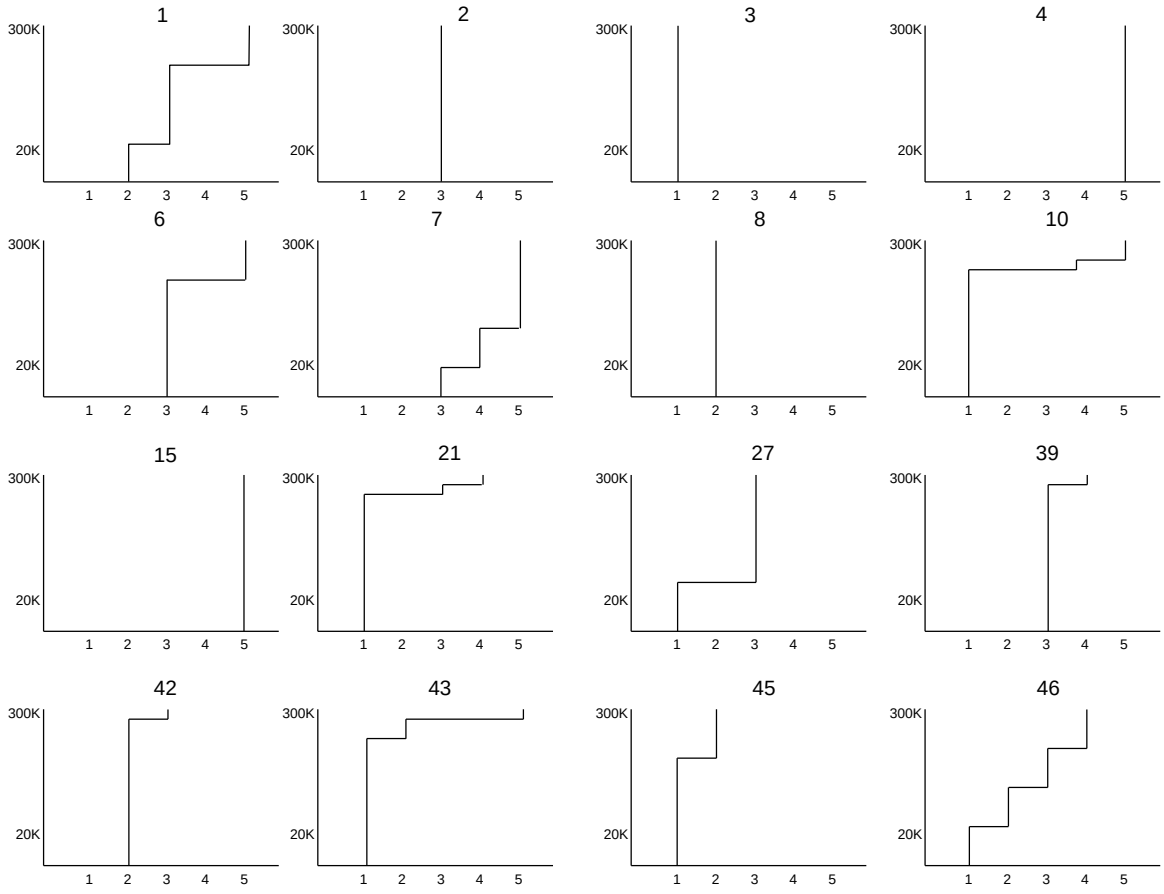


Table 2.14 reports frequencies of respondents identifying their WTB and WTS at the starting land use rights value at 300,000 RMB and ending value at 20,000 RMB in the multiple bounded question format of 15 scenarios. The majority of farmers respond that they would definitely sell land use rights at 300,000 RMB, and when the land use right value drops to 20,000 RMB, they would neither buy nor sell (186 farmers). There are 147 farmers who would neither buy nor sell land use rights at both high and low values. In the analysis, we exclude 15 economically irrational farmers presented in the lower diagonal of Table 2.14 as they are more willing to buy at higher price and more willing to sell and lower price. The farmers' response in a questionnaire of 15 scenarios asking willingness to buy and sell land use rights is used to

identify each farmer whether he is a potential net seller or buyer of land use rights. The identification of a potential buyer and seller is reported in Table 2.15.

Table 2.14: Frequencies of respondents indentifying WTB and WTS at 300,000 RMB and 20,000 RMB

		def buy	**might buy**	**neither**	**might sell**	**def sell**	
		A	**B**	**C**	**D**	**E**	start 300,000
def buy	**A**	9	4	36	18	104	
might buy	**B**	3	3	31	27	49	
nither	**C**	4	3	147	37	186	
might sell	**D**	0	0	2	6	14	
def sell	**E**	0	0	3	0	34	
		end 20,000					

Table 2.15: Identification of a potential buyer and seller[5]

start-end		**Frequencies**
A-A	Buyer	9
B-A	Buyer	4
B-B	Buyer	3
C-A	Buyer	36
C-B	Buyer	31
C-C	Neither	147
D-A*	Seller	18
D-B*	Seller	27
D-C	Seller	37
D-D	Seller	6
E-A*	Seller	104
E-B*	Seller	49
E-C	Seller	186
E-D	Seller	14
E-E	Seller	34

[5] We apply econometric analysis using OLS regression to identify potential sellers and buyers. See the Appendix.

2.11 Determinants of Land Use Rights Buyer and Seller

Farmers are influenced by different factors when making decisions to buy or sell land use rights. In this section, factors and individual characteristics associated with a potential seller and buyer of land use rights are examined. The outcome variable is the choice of farmers whether they would be a buyer or seller of land use rights described in the identification of a potential buyer and seller from a previous section. We use a seller dummy as a dependent variable which takes value = 1 if a respondent is a potential net seller, and 0 if a respondent is a potential net buyer. In a situation such as this, in which the outcome variable is dichotomous (buyer or seller), classic regression which attempts to explain the level of a continuous outcome variable in terms of a set of explanatory variables is not the most appropriate econometric method. However, by using a qualitative response model, such as the logit model, we can predict the probability that an option will be chosen. In practice, this requires that the explanatory variables adequately reflect the most important determining factors in the transaction of land use rights. Because of the causality between buyer individual and WTB; seller individual and WTS, we apply the same set of determinants of farmland value in the contingent valuation method as explanatory variables of land use rights buyer and seller model.

The Logit Model

Assume that a farmer chooses the most attractive alternative from the two options (buy or sell), the observations of the choices reveal the farmers' preferences. If we observe that a farmer *i* chooses to be a seller of land use rights, this implies that: $U_{i1} > U_{i0}$, where U_{i1} and U_{i0} are the utilities that farmer *i* associates with a seller and buyer of land use rights, respectively. The utility U_{ij} that the alternative *j* (*j* = 1: potential seller; *j* = 0: potential buyer) gives individual *i*, is

composed of two parts: a systematic term, which depends on an attributes vector *X* (demographic factors, farm attribute, production, profitability, debt, credit, liquidity, risk perception, etc.), and another random term ε_{ij}:

$$U_{ij} = \overline{U}_{ij} + \varepsilon_{ij} \tag{2.14}$$

Utility U_{ij} is not observable but we observe the decision Y_i, which is worth 1 if individual *i* chooses to sell land use rights and 0 if chooses to buy land use rights. If a rational individual chooses the alternative that gives him the greatest utility, then we would have:

$$\text{Probability } [Y_i = 1] = \text{Probability } [U_{i1} > U_{i0}]$$

$$\text{Probability } [Y_i = 0] = \text{Probability } [U_{i0} > U_{i1}]$$

In this case, the probability that farmer *i* chooses alternative 1 is[6]:

$$Prob[Y_i = 1] = \frac{e^{X_i'\beta}}{1+e^{X_i'\beta}} \tag{2.15}$$

This is the reduced form for the binomial logit model, where the X_i' row vector of explanatory variables for the individual *i* contains the independent or explanatory variables considered in a section of contingent valuation method. We assume that ε_{ij} follow a distribution of logistic probability.

The logit model results

The results of the estimation by maximum likelihood of the logit model used to analyze the influence of the explanatory variables on the probability of selling land use rights, are

[6] See McFadden (1974)

included in Table 2.16. With the attempt to avoid the problem of multicolinearity, in Logit (1) we introduce major explanatory variables, while in Logit (2) and (3) other factors and villages fixed effects are included, respectively. The F-test indicates that the variables excluded in Logit (1) and (2) are statistically significant and different from zero, therefore, the Logit (3) model is the main consideration of the study.

Factors that are strongly associated with land use rights seller and buyer are tomato, asset value, formal borrowing and near city variables. The estimated coefficient associated with the explanatory variable "tomato" is negative and statistically significant. We can affirm that tomato farmers are less likely to be sellers of land use rights because growing tomato can make high profit to them. Secondly, the financial and productive wealth of the individual, approximated by the asset value plays an important role in the land use rights transaction. The coefficient of asset value is positive and statistically significant. Therefore, the greater assets farmers possess would increase the probability of selling land use rights. This could imply a decreasing in marginal utility of holding assets. Farmers holding more assets would have less incentive to buy more land but would rather sell land use rights and receive money instead. Furthermore, formal borrowing and geographical location are found to be inversely correlated with the probability of being land use rights seller. Farmers who can access a formal credit are less likely to be sellers of land use rights. Since they are able to obtain formal loans, it is not necessary for them to sell land use rights in order to receive money. In addition, the probability of being land use rights sellers is reduced for farmers living near the city. Finally, the variables related to farm attribute, credit rationing, attitude toward risk, entrepreneurship and politics are found to be statistically insignificant on the probability of being sellers of buyers of land use rights.

Table 2.16: The logit model results

	Logit (1)		Logit (2)		Logit (3)	
Seller dummy	**Coefficient**	**P>z**	**Coefficient**	**P>z**	**Coefficient**	**P>z**
Sex (female = 1)	-0.0903995	0.728	-0.0895983	0.76	-0.4705056	0.169
Education	0.0593139	0.465	0.0697893	0.47	0.071309	0.516
Years of farming	-0.0042962	0.72	-0.0110326	0.454	-0.015671	0.34
Farm size (mu)	-0.0315166	0.507	-0.0418683	0.473	-0.067952	0.277
Farm rent dummy	0.0064532	0.982	0.0880364	0.794	0.1849891	0.636
Corn	-0.7555519*	0.087	-0.511041	0.302	0.2838759	0.673
Wheat	-0.8938567**	0.018	-0.496868	0.298	0.0046294	0.994
Tomato	-1.549513**	0.033	-1.782738**	0.03	-1.882351*	0.059
Kiwi	-0.2148573	0.889	0.2111402	0.893	-0.5406633	0.73
Household income	1.51E-06	0.776	4.08E-06	0.455	5.02E-06	0.387
Percent income farming	-0.1415371	0.789	0.080807	0.893	0.4042003	0.544
Asset value	0.000000946**	0.037	0.00000104**	0.036	0.000000949*	0.064
Informal borrow	0.1368446	0.647	0.0272987	0.936	0.059413	0.88
Formal borrow	-0.4123103	0.27	-0.4722647	0.247	-0.8724206*	0.09
Saving	-0.0706464	0.579	-0.1070951	0.472	-0.2034927	0.261
Risk Rationing	0.2396109	0.629	0.0765691	0.883	-0.4040942	0.546
Quantity Rationing	-0.1414264	0.697	0.1376389	0.741	0.4626607	0.316
Risk aversion score	-0.0052673	0.503	-0.0056837	0.539	-0.010594	0.382
Prudence score	0.0040715	0.6	0.0060608	0.524	0.0135544	0.245
Business Climate			-0.4285398*	0.051	-0.3403938	0.139
Migrant farm labor			-0.7551483	0.372	-0.3995058	0.666
Start business			-0.0967422	0.742	0.1254808	0.731
Plan to start business			0.0171945	0.957	0.2328078	0.528
Computer			0.2852951	0.679	0.7473304	0.285
Internet			-0.4614108	0.545	-0.5273312	0.512
Village leader			0.069755	0.912	0.1743132	0.82
Village committee			-0.3698162	0.548	-0.3067351	0.666
State government			-0.6282865	0.338	0.0018438	0.998
County government			0.8786926	0.134	0.754998	0.247
State enterprise			0.6114386	0.149	0.4331282	0.44
RCC or bank			-1.515237*	0.052	-0.8600447	0.356
Near city dummy			0.4175188	0.244	-17.7052***	0

(Continued)	Logit (1)		Logit (2)		Logit (3)	
Seller dummy	**Coefficient**	**P>z**	**Coefficient**	**P>z**	**Coefficient**	**P>z**
Bigong					-17.09501***	0
Datong					-18.12858***	0
Han					-19.31048***	0
Laoshang					-1.873638	0.101
Laoxia					-0.7887307	0.303
Liaodi					-17.4012***	0
Mengjiazhai					1.533198	0.202
Sihu					-18.55698***	0
Taibai					-17.60876***	0
Tangjia					1.134917	0.12
Xiaozhai					-18.46745***	0
Xidazhai					1.331552	0.511
Xieshang					0.9313091	0.432
Xixiaozhai					-0.5123116	0.56
Yindou					-18.05653***	0
Zanfan					-17.50761***	0
Zhaixi					1.106866	0.346
Constant	0.7052518	0.446	0.5555178	0.621	18.4181	.
Observations	311		268		247	

Note: *p<0.1; **p<0.05; ***p<0.01

2.12 Summary

Modern economics suggest that tenure security and land ownership would encourage agricultural investment and enhance rural economic growth. In the past few decades, Chinese farmers have failed to capitalize on the economic gains because rural land reform has not kept pace with urban land reform. China allows urban residents to trade or sell their land use contracts freely. That right has allowed people to profit from city property in ways that farmers have not legally been able to do. However, in 2008, The Chinese government has considered the policy and possibility of land use rights transfer and transactability as farmers are allowed to buy and sell land use rights for the first time. This could draw hundreds of millions of farmers more firmly into the market economy. Therefore, it is interesting to see what would happen if the Chinese government made it legal for farmers to buy or sell land use rights.

The results from the study suggest that, at the land use rights market equilibrium, the estimated equilibrium price of land use rights is 39,156.1335 RMB and the equilibrium percentage of farmers who will participate in the market is 16.43%. This is in fact a significant portion of the population participating in the market which numbers over 131 million farmers representing 800 million farmers employed in an agricultural sector in China. In contrast, the liberalization of land use rights in Vietnam in the early 1990s resulted in only about 3% of land use rights being transacted. The price elasticity of demand is equal to -0.952 and the price elasticity of supply is 0.8623. the inelasticity of demand and supply would imply changes in land use rights value have a relatively small effect on the changes in percentage of farmers willing to buy and sell land use rights.

We apply the contingent valuation method to estimate the value of land use rights by incorporating several determinants of land value. The expected maximum WTB and minimum

WTS from self-declare questions are 23,551.34 RMB and 68,642.95 RMB respectively. With the existence of land use rights market, the expected value of land use rights would probably be in between the value of 23,551.34 RMB and 68,642.95 RMB. However, the expected maximum WTB and minimum WTS from polychotomous choice format are found to be 58,881.91 RMB and 96,871.68 RMB respectively. We apply OLS regression using data from self-declare questions but apply Tobit regression using data from polychotomous choice questions. The main issue is "which type of questions and model specification is better?". The self-declare question might be better in the sense that we can directly obtain the true value of willingness to buy and sell of land use rights. The estimated market equilibrium land use rights value derived from the power function is also in the range of WTB and WTS values estimated from OLS regression. In contrast, the expected value of land use rights estimated from tobit model of polychotomous choice is much higher. Because of the uniqueness of our multiple bounded questions, we apply a tobit model with censored data at the upper bound (300,000 RMB) and lower bound (20,000 RMB) in the polychotomous choice questions format. However, the polychotomous choice format is better than self-declare questions in term of the flexibility in revealing WTB and WTS. Some respondents might be unwilling to precisely reveal their WTB and WTS value, so the polychotomous choice questions format is another option in that a respondent can answer in qualitative responses from "definitely buy" to "definitely sell" at a given value. In addition, the polychotomous choice questions format also give the important information about the elasticity of demand and supply of land use rights.

The OLS results from self-declare questions indicate that tomato farmers, risk rationed and quantity rationed individuals, farmers who have computer at home, have family members work for village committee and farmers live near the city are more likely to place high maximum

WTB value of land use rights which cause the increase in value of land use rights in the market. Moreover, several factors have significant impact on the minimum WTS. Household income, percentage of income from farming and asset value are positively related to WTS of land use rights. Farmers who can generate high income from farming would sell land use rights at a high price because their marginal productivity of land is relatively high. In addition, farmers who have ever stated business have high minimum WTS and would be more likely to remain the agriculture. However, farmers who can access to a formal credit or who reside near the city have a low minimum WTS. Farmers whose land located near the city want to sell land use rights because they have more opportunity to work in the city.

The tobit model results using data from polychotomous choice questions suggest that corn, wheat farmers, having computer at home and good business climate have reverse effect on maximum WTB and would decrease value of land use rights. However, farmers having more saving, having internet access at home or having family members working for state enterprise place relatively greater maximum WTB value of land use rights. The minimum WTS for land use rights depends on several factors. Female respondents and farmers having internet access place relatively greater maximum WTB value of land use rights. In contrast, percentage of income from farming and saving are found to be negatively correlated with WTS. In addition, having family members work as a village leader or work in a county government would cause a decrease in minimum WTS.

Factors associated with potential buyers and sellers are also examined in the last section. The results show that tomato farmers are less likely to be sellers of land use rights because growing tomato can make high profit to them. Furthermore, farmers who can access a formal credit and who live near the city are less likely to be sellers of land use rights. On the contrary,

the greater assets farmers hold would increase the probability of selling land use rights. The probability of buying and selling land use rights also varies between village regions.

The study shows preliminary representation of the land use rights market structure if the transaction of land use rights is implemented. Clearly, several factors significantly affect WTB and WTS. The characteristics of potential buyers and sellers differ depending on the production, income, geographical location, etc. As Deininger et al. (2006) suggest, more detailed investigation of the factors affecting the implementation of legal and institutional change aiming to make property rights more secure could provide important insights for policy makers

The results have important policy implications. If the goal is to enhance rural development through the land use rights market which would benefit both the agricultural sector and farmer wealth, then the government should encourage farmers to buy land use rights, increase farm invest and expand the production. Results also suggest that farmers who grow high profit crops are more likely to buy land use rights and stay in farm. In addition, risk rationed and quantity rationed individuals are more likely to buy land use rights at high price. Farmland has served as collateral for farm mortgages, reducing the effect of capital costs for both expansion and operating credit. Therefore, it is important to enhance the certainty and security of land use rights contract. Also, the consideration whether land contracts should be extended to 70 years from 30 years should be seriously addressed as it would give farmers more security and presumably increase the value of their land use rights. In general, farmland is crucial to the economic stability in the agricultural sector as it is a significant factor of production and a traditional source of wealth to farmers. Farmland values have served as a combination of both a retirement portfolio and an estate for bequest to future generations of farmers. Changes in

farmland values overall are strongly associated with changes in returns to farmland, Salois et al. (2010).

However, there is a debate that the policy allowing farmers to transact their land use rights might create a few landlords and many landless farmers who will have no means for a living. Farmlands might be used for non-farming purposes which later may threaten the country's food safety. However, the Chinese government has insisted that the country must remain self-sufficient in the production of foods, and is highly unlikely to allow farmers to sell land use rights for nonagricultural development. Chau et al. (2011) observe that socially excessive land conversion from agriculture to construction can occur in cycle with aggressive land development efforts in rural areas, through a land administration policy that explicitly links allowable land conversion quotas with land development efforts. Nevertheless, China planned to carry out "the most stringent farmland protection system" and urge local authorities to firmly safeguard the 1.8 billion mu (120 million hectares) minimum farmland set line and also called on local governments to stick to "the most stringent land conservation system" to strictly control the total scale of the land used for urban development (Chinareview.cn 2008).

Lastly, urbanization policy and influx of rural migration must be seriously considered. Many traditionalists strongly support collective land ownership and argue that China’s economy is still not robust enough to absorb hundreds of millions of full time rural workers. They also support the system of allocating small plots of land to all rural households as guaranteeing farmers a subsistence income. However, the results show that over 131 million farmers representing 800 million farmers will participate in land use rights market; then approximately 65.5 million farmers would leave agriculture. Relatively rich farmers tend to sell land use rights at low price and would be more likely to sell their land use rights implying that they want to exit

farming. In addition, the rapid economic growth in China would lead to an increase in employment opportunities and thus, farmers are encouraged to leave agriculture and move to cities as migrant workers. Consequently, policies directed towards promoting off-farm income and employment, and thereby stimulating urban growth, are more appropriate.

2.13 Appendix

Identification of a potential buyer and seller

The OLS regression is applied to identify a potential net seller or buyer of land use rights for each farmer. The dependent variable is a self-declare seller dummy taking value = 1 if respondents reveal the value of minimum WTS, value = 0 if respondents reveal the value of maximum WTB, otherwise it is a missing value. Independent variables AA to EE, except the lower diagonal in Table 2.14, are dummy variables of farmers who respond WTB and WTS at the starting value of 300,000 RMB and ending value of 20,000 RMB in a questionnaire of 15 scenarios. Variables DA, DB, EA and EB are of interest because these variables are difficult to identify whether respondents are a net seller of buyer as they would sell and a higher value and buy at a lower value, while other variables are trivial. The control variables are self-declare WTB or WTS value, farm size and percentage of income from farming. The OLS results to identify a potential buyer and seller are reported in Table 2.17. According to the results, coefficients of DA, DB, EA and EB are positively significant implying that they are potentially net sellers.

Table 2.17: Potential net seller and net buyer OLS results

Self-declare seller dummy	Coefficient	P>t
AA	-0.0172487	0.917
BA	-0.2416073	0.286
BB	0.0192932	0.951
CA	0.0559645	0.577
CB	0.1589074	0.132
CC	0.2439206***	0.004
DA	0.2062688*	0.1
DB	0.3100309***	0.004
DC	0.5276356***	0
DD	0.7868582***	0
EA	0.3713547***	0
EB	0.4648264***	0
EC	0.6022312***	0
ED	0.8709643***	0
EE	0.5473235***	0
Self-declare WTB or WTS value	0.00000186***	0
Farm size (mu)	0.004122	0.554
Percentage income farm	-0.1178192	0.124

Note: *p<0.1; **p<0.05; ***p<0.01

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CHAPTER 3

RISK RATIONING IN CHINA RURAL CREDIT MARKETS

3.1 Introduction

The presence of information asymmetry creates the quantity rationing problem in credit markets. Lenders do not know as much about a borrowers' likelihood of repayment as the actual borrowers do. A tradeoff between interest rate and collateral is therefore required by lenders to offset default risk. A collateral loan is often offered at a lower interest rate than an unsecured loan, because there is a guarantee of repayment should the borrower default on the loan. Nevertheless, previous literature has shown the existence of risk rationing and its significance as the borrower voluntarily withdraws from the credit market even he has the collateral wealth needed to qualify for a loan contract.

Boucher et al. (2009) use survey data from Peru to measure the incidence and impact of credit constraints in the formal credit sector. They find risk rationed households accounts for a significant fraction of the sample. They also provide examples of responses associated with risk rationing. Of these, the most common response in each of the surveys they conducted was "I don't want to risk my land". Guirkinger et al. (2008) develop a model and show that collateral requirements imposed by lenders in response to asymmetric information can cause not only quantity rationing but also transaction cost rationing and risk rationing.

Recent literature by Boucher et al. (2008) (BCG) presents theory of risk rationing and identify the necessary and sufficient condition of risk rationing incidence. They also provide evidence of risk rationing in Peru, Honduras and Nicaragua. We find their theoretical paper of risk rationing is intriguing. Turvey et al. (2009) argue that the incidence of credit rationing is blurred when risk is introduced. They suggest that utility maximizing farmers will reduce their demand for credit as risks increase or farmers become more risk averse. Credit choices are as

much determined by endogenous risk aversion and production and market uncertainties as well as external influences.

In fact, in a 2009 survey of Chinese farmers in Gansu and Shaanxi provinces Turvey et al. (2011) asked a small number of questions related to the hypothetical possibility of the mortgagability of land use rights as a form of collateral. One of the arguments raised in favor of the transferability of land use rights was that the rights could be used as collateral against a loan. This argument was predicated on the assumption that farm households were to a large extent credit rationed. However, it was found that a large number of farm households would not use land use rights as loan collateral. Approximately 45.8% either disagreed or strongly disagreed with using the land use rights as collateral, compared to only 35.4% who moderately agreed or strongly agreed to use land use rights as collateral. Because the questions specifically referred to land use rights as collateral, the results strongly hinted of the possibility that risk rationing was wide spread in rural China, and if so this would dampen the overall impacts of credit reforms currently under way in China. Politically, evidence of risk rationing in rural credit market would suggest that the effectiveness of land titling policy encouraging farmers to pledge their rights as collateral security may be overestimated.

The purpose in preparing this study is to provide a specific test of BCG framework on risk rationing and examine the attributes of risk rationed, quantity rationed, and price rationed farmers. As a commentary our intention is not at all to criticize this model. Indeed, the reasoning is quite the opposite in that we find risk rationing as a topic of inquiry to be critically important in understanding borrower behavior and credit decisions, and as we indicated above we find the models presented in BCG to be fascinating from the points of view of academic completeness and public policy guidance.

Turvey et al. (2011) 2009 survey was not detailed enough to state anything stronger than a 'suggestion' of risk rationing, nor was it constructed to specifically isolate risk rationing under the specific conjectures and hypotheses raised by BCG. In this study we report survey results from a follow-up survey of 730 farm households conducted in Shaanxi in November 2010 and designed specifically to test the conjectures and hypotheses of BCG. Our approach uses the direct elicitation methodology (DEM) where a set of questions directly elicits the household's status as either credit constrained versus unconstrained, and is similar to an approach recommended in Boucher et al. (2009).

The rest of this chapter proceeds as follows. In the next section, we briefly review the risk rationing definition. In Section 3.3 and 3.4, we describe a model and credit rationing status and sample survey questions to identify credit constraint status. Section 3.5 describes the survey and data that are used in the analysis. The descriptive statistics, summary of household characteristics and frequencies by credit constraint status are presented. Next, several testable hypotheses are derived. In Section 3.7, we introduce the model and determinants of credit constraint Status. The empirical results are presented and discussed in the following section. Section 3.9 concludes and discusses the policy implications of the findings.

3.2 Risk Rationing Definition

The study by BCG presents theory and implication of risk rationing. They define risk rationing as follow; "Risk rationing occurs when **insurance markets are absent**, and lenders, constrained by **asymmetric information**, shift so much contractual risk to the borrower that **the borrower voluntarily withdraws from the credit market** even when **he has the collateral wealth needed to qualify for a loan contract**".

According to the risk rationing description, four important conditions specified in bold are needed to be considered. First, risk rationing occurs when insurance markets are absent. Risk plays an important role in human livelihood, particularly for farmers who typically exposed to the price shocks, yield and weather risk. With these uncertainties, farmers, particularly risk averse farmers, attempt to minimize their exposure to risk by participating in insurance market. Nevertheless, it is unclear whether existing insurance markets, in spite of their imperfections, are sufficient to ensure that the risk rationing is negligible and can be ignored. The presence of insurance markets in rural China thus leads to prediction regarding the relationship between insurance market and risk rationed farm households. Second, lenders constrained by asymmetric information. Asymmetric information – adverse selection and moral hazard – among lenders results in a less efficient allocation of resources (Sharpe 1990). In the presence of asymmetric information, lenders increase interest rate or require borrowers to pledge collateral in order to decrease a default risk as they cannot observe the different types of borrowers. The increase in interest rate and collateral requirement may lead to the third condition; the borrower voluntarily withdraws from the credit market. Fourth, the borrower has the collateral wealth needed to qualify for a loan contract. Borrowers that pledge collateral should be perceived as less risky. However, by combining the third and forth conditions, the risk rationed borrowers have enough collateral but are not willing to pledge collateral and choose not to accept the offered contract. This is related to risk perception of borrowers associated with a loan contract.

From definition, they assume these four conditions are important for risk rationing to occur. Testing these conditions is one of the purposes of this study. We are interested to see whether the insurance markets, asymmetric information, risk and collateral are essentially related to risk rationing in economic context.

3.3 Model

The model structure is based on BCG[7]. A farmer chooses activity choice between a safe, subsistence reservation activity and a risky commercial activity where the latter must be financed by an optimally designed credit contract offered by a competitive sector of lenders.

Agent's endowments are consist of financial wealth,W, and land, T. Financial wealth is liquid and can be used as collateral to secure production loans. Land can also be used as collateral and sold at price p_T.

Agents allocate their land between two activities; reservation or subsistence activity which is safe and commercial activity which is risky but gives higher return.

A reservation activity does not require capital and yields a certain return ω per unit land. A risky commercial activity requires a fixed investment k per unit land and yields an uncertain return with gross revenues x_g per unit land if good state is realized and gross revenues x_b per unit land if bad state is realized.

Assume an agent has additively separable utility function

$$U(C_j, e) = u(C_j) - d(e) \tag{3.1}$$

where C_j is consumable wealth in state j and e is the effort exerted in production which can be either high ($e = H$) or low ($e = L$). The disutility of effort, $d(e)$, is increasing in effort so that $d(H) > d(L)$. Let ϕ^e be the probability of the state of nature under effort e, so that $\phi^H > \phi^L$.

Assume $W < Tk$ so that an agent must borrow to utilize the commercial activity.

The optimal contract maximizes the agent's expected utility subject to the principal's (lender's) participation constraint and the agent's incentive compatibility constraint (ICC). We

[7] The entirety of section 3 is developed and paraphrased from the theoretical development originating in BCG.

solve for optimal loan contract (s_g, s_b) where s_g and s_b are the borrower's payoff per unit area financed under the good and bad states of nature.

$$Max_{s_g,s_b}\ Eu\big(W + (p_T + s_j)T \,\big|e = H\big) \tag{3.2}$$

$$subject\ to:$$

$$\pi(s_j|H) \equiv\ \phi^H(x_g - s_g) \tag{3.3}$$

$$+(1 - \phi^H)(x_b - s_b)$$

$$-rk \geq 0$$

$$\big[u\big(W + (p_T + s_g)T\big) - u(W + (p_T + s_b)T)\big] \tag{3.4 ICC}$$

$$\times\ (\phi^H - \phi^L) \geq d(H) - d(L)$$

$$-s_j \leq \frac{W}{T} + p_T;\quad j = g, b \tag{3.5}$$

Quantity rationing occurs when

(a) the agent would be offered and demand a credit contract in the symmetric information world; but,

(b) the agent lacks sufficient wealth to collateralize the contract (i.e.,$W + p_T T < -T s_b^*(W, T)$).

Risk rationing occurs when

(a) the agent would be offered and demand a credit contract in the symmetric information world;

(b) the agent is offered a financially feasible contract in the asymmetric information world (i.e., $W + p_T T \geq -T s_b^*(W, T)$) but,

(c) the agent chooses not to accept the offered contract, preferring the reservation subsistence activity.

3.4 Credit Rationing Status

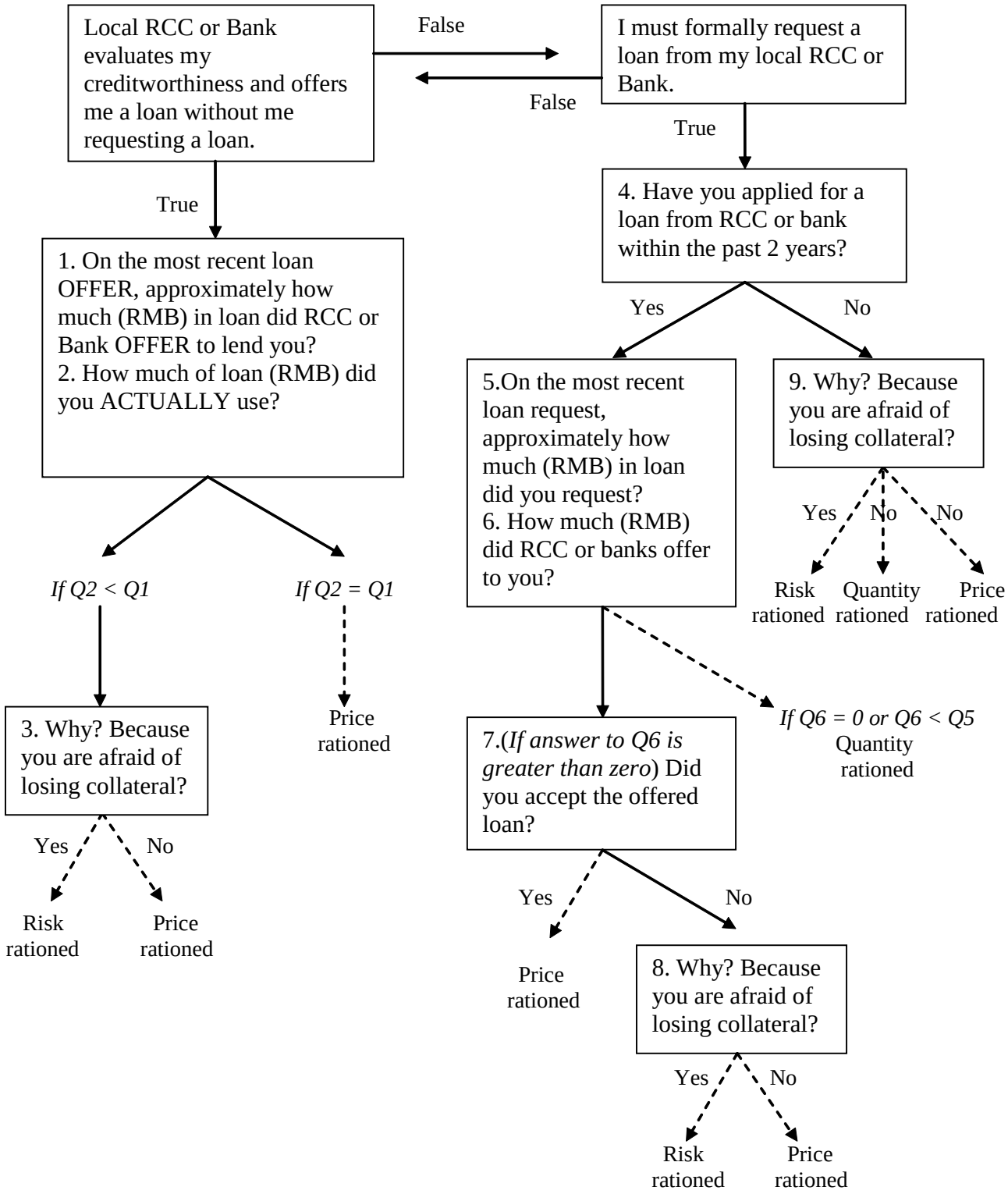
The survey asked questions that made it possible to infer respondents' credit rationing status based partly on Boucher et al. (2009) strategy to directly elicit credit constraint. Constraint categories can be defined as follows.

1) Price rationed or unconstrained farmer is the one who may be either non-borrower or borrower and was happy with the amount he received. A price rationed farmer is not affected by asymmetric information in credit markets as he does not face a binding credit limit.
2) Quantity rationed or supply-side-constrained farmer may be either an applicant who was rejected a loan or a non-applicant who knew that he would be rejected. A quantity rationed farmer faces a binding credit limit, therefore; the limiting constraint comes from the supply side. A quantity rationed farmer is expected to have excess demand.
3) Risk rationed or demand-side-constrained farmer does not face a binding limit and therefore does not have excess demand for credit. The limiting constraint comes from the demand side. The demand is lower because of the risk-sharing rules associated with the loan contract.

We apply DEM to gather information on the credit market perceptions of both borrowers and non-borrowers. Figure 3.1 shows sample survey questions to identify credit constraint status. The survey questions are structured as follows. We divide Chinese farmers into two groups.

Farmers in the first group do not have to apply for a loan but instead RCC or bank evaluate their creditworthiness and offer them a loan. Farmers in the second group must formally request a loan from their local RCC or Bank. In the first group, since RCC or bank offer a loan without them requesting a loan, then farmers are not quantity rationed. We asked the first group "How much of loan did RCC or Bank offer to lend you?" and "How much of loan did you actually use?". Risk rationed farmers are individuals who responded that the amount of loan they use is less than the amount RCC or bank offer because they are afraid of losing collateral, otherwise; they are price rationed. In the second group of farmers who must request a loan, we further asked whether they applied for a loan from RCC or bank within the past 2 years. It is very challenging to classify the constraint status of individuals who do not participate in the credit market. They might not have applied for a loan because of three reasons; first, they had enough money and no need to borrow (price rationed); second, they knew that they would be rejected (quantity rationed); or third, they were afraid to lose collateral (risk rationed). On the other hand, among the loan applicants, farmers who applied for a loan but either they were rejected or RCC offered the amount of loan less than the amount they requested are quantity rationed. Price rationed farmers are either who accepted the approved loan or who applied but did not accept the approved loan because of reasons other than risk associated with a loan contract. Risk rationed farmers did not accept the approved loan because they are afraid of losing collateral. Three types of credit rationed farmers namely risk rationed, quantity rationed and price rationed farmers have been identified and used as dependent variables.

Figure 3.1: Sample survey questions to identify credit constraint status



3.5 Survey and Data

The farm household survey was conducted in Shaanxi province, Yangling district in November 2010. Seven hundred thirty households were surveyed. Each household was interviewed by graduate students from Northwest Agriculture and Forestry University. The survey itself dealt exclusively with farm credit, risk perception and management, transaction of land use rights, and entrepreneurship.

The characteristics of these communities are as follows. On average there are about 5 people living in each household. The average education level of respondents is between attending middle school and completing middle school. The average number of years farming is 28 years, and the average farm size is 5mu (about 5/6th of an acre). Household income average is 23,796 RMB/year with approximately 39% of household income coming from farm activities. The average profit per year earned from cropped land is 953 RMB/mu. The average asset per household is 318,904 RMB. There are 203 farmers indicating the amount of their debt and the average debt per household is 29,330 RMB. Table 3.1 reports the descriptive statistics on some variables.

Table 3.1: Descriptive statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
Sex (Female =1)	730	0.5452055	0.4982937	0	1
Age	730	48.72	11.361	18	78
Education	730	4.371233	1.836378	0	8
Household member	730	4.88	1.512	2	18
Years of Farming	726	27.66529	13.54714	0	65
Farm Size (mu)	728	4.930192	2.818299	0	40
Household Income (RMB)	721	23,796.44	23,048.36	0	248,000
Percentage farm Income	720	0.3929722	0.2932866	0	1
Asset Value (RMB)	703	318,904.4	1,897,610	0	50,000,000
Farm Profit (RMB)	710	952.7394	1,915.054	0	25,000
Amount of Debt (RMB)	203	29,329.6014	58,190.011	0.01	600,000

In order to identify risk ration farmers from the survey response, we apply DEM and separate Chinese farmers into two groups (see figure 3.1). The first is a group of 52 farmers who did not request a loan but a local RCC or bank evaluates their creditworthiness and offers them a loan. Among farmers who borrowed less than the amount that the lender was willing to provide, 27.3% indicated that they did not use the total amount of credit made available to them because they are afraid of losing collateral. In the second group, 672 farmers must formally request a loan from their local RCC or bank. There are 121 farmers who have applied for a loan within the past two years and no risk rationed farmer is found in this loan applicant group. Among farmers who have not applied for a loan, approximately 7.5% of these farmers are risk rationed. They responded that they have not applied from RCC or bank in the last two years because they are afraid of losing collateral. Among all 730 respondents, the total proportion of risk rationed farmers is approximately 6.2%. Considering this percentage of risk rationing from our result, when we generalize this percentage to 350 million farm households in China, there are approximately 21.7 million farm households who are risk rationed.

To compare characteristics among credit rationed farmers, quantity rationed and price rationed farmers were also identified. Approximately 14% of all respondents are quantity rationed who indicated that they must formally request a loan from RCC or bank and have applied for a loan within the past two years but RCC or bank either did not offer them any loan or offered less than the amount requested. Quantity rationed farmers are also farmers who have not applied for a loan because they knew they would be rejected. We include farmers who responded they did not applied for a loan because they are not a credit worthy or they cannot get a guarantee in a quantity rationed group because they would know that RCC or bank will reject their loan application. The rest are price rationed farmers with a proportion of 79.9% who indicate; first,

they actually used a loan that RCC or bank offered to them without requesting a loan; second, they have applied for a loan and accepted the offered loan; or third, they are non-borrower and no need to borrow.

Table 3.2 provides a summary of household characteristics and frequencies by credit constraint status. Among 730 respondents, the majority of farmers are price rationed. Approximately 14% and 6.2% of all respondents are quantity rationed and risk rationed farmers respectively. The table compares the means and medians of several key variables for 3 types of credit rationed farmers. Risk rationed farmers tend to be a bit younger and substantially more educated than quantity and price rationed farmers. The household income, asset value and farm profit of quantity rationed farmers are less than that of risk rationed and price rationed farmers. As expected, poor farmers are more likely to be quantity rationed as it is difficult to get a loan approval by RCC or bank. Risk rationed farmers have the highest median of household income, asset value and farm profit but the lowest amount of debt.

Table 3.2: Summary of household characteristics and frequencies by credit constraint status

	Non-price Rationed							
	Risk Rationed		**Quantity Rationed**		**Price Rationed**		**Total**	
	mean	**median**	**mean**	**median**	**mean**	**median**	**mean**	**median**
Sex (Female =1)	0.67	1.00	0.54	1.00	0.54	1.00	0.55	1.00
Age	44.87	47.00	48.70	50.00	49.02	50.00	48.72	50.00
Education	4.67	5.00	4.17	5.00	4.38	5.00	4.37	5.00
Years of Farming	25.87	27.00	29.54	30.00	27.48	30.00	27.67	30.00
Farm Size (mu)	5.00	5.00	5.18	5.00	4.88	5.00	4.93	5.00
Household Income (RMB)	26,337.18	22,000.00	21,301.18	16,000.00	24,040.67	20,000.00	23,796.44	20,000.00
Percentage farm Income	0.41	0.30	0.42	0.36	0.39	0.31	0.39	0.32
Asset Value (RMB)	210,166.67	200,000.00	208,234.69	145,000.00	346,280.28	150,000.00	318,904.41	150,000.00
Farm Profit (RMB)	1,296.67	700.00	564.55	500.00	994.81	500.00	952.74	500.00
Amount of Debt (RMB)	21,500.00	7,500.00	29,009.19	10,000.00	29,837.78	20,000.00	29,329.60	18,000.00
Observations	45		102		583		730	
Percentage of sample	6.2		14		79.9		100	

3.6Testable Hypotheses

BCG has identified conditions under which risk and quantity rationing will exist. Based on their theory and implication, a number of testable hypotheses that describe the most important factors explaining the existence of risk and quantity rationing were formulated as follows.

1) Wealth-biased quantity rationing[8]

Quantity rationing is decreasing in financial wealth and productive wealth. Financial wealth is liquid and can be committed as collateral to secure production loans. Productive wealth is land which can also be used as collateral. BCG show that quantity rationing is unambiguously biased against the poor. An increase in financial wealth tends to relax quantity rationing, an increase in an agent's land endowment, whether it is titled or untitled, will also relax quantity rationing.

2) Risk rationing and financial wealth

2.1) The financial wealthy is risk rationed.

Thiele et al. (1999) and BCG demonstrate that the occurrence of risk rationing may depend on the type of wealth considered. They obtain the results that the financial wealthy will be risk rationed[9].

2.2) Risk aversion and Prudence are significantly associated with risk rationing.

Under proposition 2 in BCG[10], risk rationing can be biased either for or against the

[8] See Boucher, S., M. Carter, et al. (2008) Proposition 1, page 414

[9] Boucher, S., M. Carter, et al. (2008) argue that whether it is the financially poor or the financially rich that are risk rationed depends on the relative strength of the two opposing effects namely risk-aversion effect and incentive-dilution effect. Risk-aversion effect states that those agents who are more sensitive to risk would be more likely to be risk rationed. Assume decreasing absolute risk aversion (DARA), we might expect that the relatively poor agents are risk rationed. Incentive-dilution effect states that financially wealthier agents are less sensitive to a given contractual risk and must then face riskier contracts than poorer agents in order to maintain incentive compatibility. Therefore, the relatively rich agents are risk rationed.

[10] See Boucher, S., M. Carter, et al. (2008) Proposition 2, page 416

financially wealthy. Therefore it is not clear whether the rich or the poor agents are risk rationed. BCG propose that 1) If $P > 3A$, then an agent with financial wealthy (rich) will prefer commercial activity and poor will prefer subsistence activity and be risk rationed and 2) If $P < 3A$, poor will prefer commercial activity and rich will prefer subsistence activity and be risk rationed, where P and A denote the prudence and coefficient of absolute risk aversion respectively. We want to test hypothesis that risk aversion and prudence are significantly correlated with risk rationing.

3) Risk rationing and productive wealth

The relatively land-poor is risk rationed. The authors argue that exploiting the land with the risky activity yields a higher return. As farm size increases, moving back to the safe activity becomes increasingly costly. The land-wealthy will choose to participate in the credit market and fully exploit their productive asset (land). Therefore, relative land-rich is less like to be risk rationed.

4) Risk rationing and insurance market, asymmetric information and elasticity of demand for credit

Risk rationing occurs when insurance markets are absent; the agent would be offered and demand a credit contract in the symmetric information world; the agent is offered a financially feasible contract in the asymmetric information world but, the agent chooses not to accept the offered contract, preferring the reservation subsistence activity (Boucher et al. 2008). According to the definition, we hypothesize that insurance market is not associated with risk rationing; asymmetric information is related to risk rationing.

Several recent studies examine the credit demand using data from several developing countries, see Dehejia et al. (2011) and Karlan et al. (2008). Dehejia et al. (2011) estimate the

demand for credit in Bangladesh and find that borrowers are highly sensitive to interest rate changes[11]. Turvey et al. (2011) estimate individual household credit demand elasticities based on 897 farm households surveyed in Shaanxi and Gansu provinces in China and find that as interest rates fell the demand for credit increased in elasticity. However, they do not find any statistical indication of a relationship between suggested acceptance of risk and the demand elasticity. We want to further explore the sensitivity to interest rate by credit constraint status. Risk rationed farmers choose not to accept the offered loan because of the risk associated with the offered contract. This can imply that changes in interest rate should not lead to changes in quantity demand for credit of risk rationed farmers. Therefore, we hypothesize that risk rationed farmers are not sensitive to interest rate and have perfectly inelastic demand for credit.

3.7 The Model and Determinants of Credit Constraint Status

The analysis applies the linear probability model and the logit model using a robust estimator to test the hypotheses. Each model, we present three regressions that differ in the dependent variable. The dependent variables include risk rationing, quantity rationing and price rationing identified based on credit rationing status.

Independent variables

We define the independent variables into several categories, each designed to capture the effects on credit rationing. The demographic variables in a model consist of sex, education and year of farming,

Measures for wealth. In literature, both financial wealth and productive wealth are

[11] They also find that less wealthy households are more sensitive to the loan price comparing to the wealthier household.

significantly associated with credit rationing. Specific variables include farm size, household income, percentage of farm income, asset value and saving. Farm size is a proxy of productive wealth and the rest are proxies of financial wealth.

Measuring for risk aversion and prudence. We asked a series of questions about risk taking, risk mitigating and precautionary saving behavior that would reflect such attributes and used data to compute a risk aversion score and prudence score. Risk aversion score is calculated based on farmers' willingness to take risk, risk management options use and perceptions. In the survey form farmers were asked to identify their willingness to accept greater production risks in order to increase the chance of higher profits, to take risks with new technologies, and to take risks with new management practices before seeing good results in other farms. In addition, farmers indicated how important of risk management in their farm. Risk management options that we asked include farm diversification, geographic diversification, irrigation, marketing diversification, forward contract, participation in government programs, maintaining financial reserves and investing off-farm for other sources of income. Prudence score is calculated based on the purposes of their precautionary savings. Farmers specified their level of agreement or disagreement on a five-level Likert scale for a series of statements; I save in case my automobile break down; I save for unexpected medical emergency; I save to protect job loss; and I save for unanticipated crop loss. The higher the score would indicate that the respondent is more risk averse and prudence.[12]

Measure of insurance market participation is represented by insurance variable. Farmers indicated whether they regularly purchase insurance for any of the following items: life insurance, fire insurance for home and, automobile insurance, health/medical insurance, farmer's

[12] We also conducted a simple field experiment to estimate the partial risk aversion coefficient of the farmers based on Binswanger (1981) which is used as a proxy of risk aversion.

minimum living standard security, rural old-age insurance, crop insurance, and livestock insurance. The higher value of insurance variable would imply the more participation in insurance markets.

To capture asymmetric information aspect, we include two binary variables; credit worthy and group guarantee variables. In the presence of asymmetric information, creditworthy borrowers may be denied credit because they are unable to meet such collateral requirements or pay such high interest rates. Loan may be disapproved if borrowers are not a member of group guarantee in which every member of a group ensure the repayment of all members. Credit worthy variable takes value 1 if a respondent indicated he is currently considered a 'Credit Worthy' borrower by local RCC, or 0 otherwise. Group guarantee variable takes value 1 if a respondent indicated he is a member of a Group Guarantee, or 0 otherwise.

Elasticity of demand for credit. We estimate the sensitivity of the quantity demanded for credit to changes in the interest rate. Using 7% interest rate as a benchmark, farmers were asked to rank on a five-point ordinal scale (from Definitely Borrow a lot more to Definitely not borrow anymore) when interest rate decreases from 7% to 6%, 5%, 4%, and 3% (called lower interest rate) and increases from 7% to 8%, 9%, 10%, and 11% (called higher interest rate), assuming that respondents can borrow as much as they need. We create 10 binary variables to indicate characteristics of each respondent whether his credit demand is perfectly inelastic; highly inelastic, medium elastic, moderate elastic and highly elastic for lower and higher interest rate. Numerical criteria to specify each of elasticity of demand for credit variable are presented in the Appendix.

Furthermore, we include binary variables for whether the respondent held informal credit (friends and family); and/or formal credit (RCC or bank) to capture effects between formal and

informal credit. In addition, farmers identified the willingness to borrow if they can use their land use rights as collateral for a loan on a five-point scale (from definitely borrow more to not borrow any more). The higher the value of the land use rights as collateral variable, the less likely farmers will borrow. Finally, we include a dummy variable to account for farmers' entrepreneurial activity. The variable "Ever started business" takes value 1 if respondents have ever started a new business and 0 otherwise. Whereas, the variable "Plan to start business" takes value 1 if respondents are planning to start a new business and 0 otherwise.

3.8 Empirical Results

In this section the results of the hypotheses testing are reported. Table 3.3 and 3.4 present results from a linear probability model and logit model respectively. The theory suggests that there will be a negative relationship between quantity rationing and wealth. We find that this holds true. In both models, it is found that there is a negative and significant relationship between quantity rationed farmers and asset value. In addition, asset value is also negatively associated with quantity rationing but positively associated with price rationing. As expected, relatively financial poor is more likely to be quantity rationed because from lenders' perception, the likelihood of repayment of the poor may be small. However, this does not appear to be the case for the productive wealth, which has an insignificant coefficient for the farm size variable on both quantity and risk rationing. We also tested the hypothesis that the financial wealthy is risk rationed and this does not hold true in both models. The result is not consistent with what Thiele and Wambach (1999); and BCG found, specifically it is the financially wealthy who will be risk rationed.

We find risk aversion and prudence are strongly correlated with risk rationing and

quantity rationing. There is a positive and significant relationship between risk aversion score and risk rationed farmers, given prudence score = 0. This also holds true for prudence score and risk rationed farmers, given risk aversion score = 0. As anticipated, relatively high risk averse and prudent farmers tend to be risk rationed. This is consistent with Boucher et al. (2009) that expect risk rationing should be more likely among households that are more risk averse. The coefficient on interaction term between risk aversion and prudence is negative and significant indicating that risk aversion and prudence attribute work in an opposite direction for risk rationed farmers. On the other hand, the unique effect of risk aversion and prudence on quantity rationed farmers are negative when prudence score = 0 and risk aversion score = 0 respectively. The coefficient on interaction term between risk aversion and prudence is positive and significant showing that risk aversion and prudence attribute of quantity rationed farmers are complementary.

In addition, the likelihood of being risk rationed increases significantly with participation in insurance markets as presented in both linear probability model and logit model. Risk averse households tend to have a higher willingness to pay for insurance and participate in insurance markets and are more likely to be risk rationed. This is to confirm that risk rationing may exist with the presence of insurance markets. The evidence contradicts with the risk rationing characterization given by BCG stating that risk rationing occurs when insurance markets are absent. In contrast, the likelihood of being quantity rationed significantly decreases with the increase in insurance markets participation. Quantity rationed individuals are less likely to participate in insurance markets.

Being considered as a credit worthy and being a member of group guarantee appear to have no impact on risk rationing. However, credit worthy is significantly decreasing with

quantity rationing as anticipated. Creditworthiness has to do with the ability of a borrower to pay current debt in a timely manner. Lenders would be more willing to provide loan to credit worthy individuals, therefore; credit worthy individuals are less likely to be quantity rationed. In linear probability model, coefficients of credit worthy and group guarantee are significant and positive on price rationed farmers. This could simply be that farmers who are credit worthy or are member of group guarantee are more likely to be price rationed, which can be either borrowers who were happy with the amount they received or non-borrowers.

Dummy variables of respondents' elasticity of credit demand at lower and higher interest rate are included in the model and are compared with perfectly inelastic credit demand. In linear probability model, the elasticity of demand for credit does not appear to be significant on risk rationing. In other words, we cannot distinguish risk rationed farmers by their sensitivity to changes in interest rate. This seems to be consistent with the hypothesis as the interest rate variation should not affect the credit demand of risk rationed individual but the risk perception which is innate characteristics. Considering other type of credit rationed farmers, results show that quantity rationed individuals are less sensitive to high interest rate than others. But price rationed individuals are more sensitive to high interest rate and less sensitive to low interest rate. This illustrates the excess demand for credit of quantity rationed farmers as interest rate increases or decreases relative to price rationed farmers. The results in logit model are consistent with those in linear probability model except that now risk rationed farmers are more sensitive to low interest rate. Table 3.5 and 3.6 also present results from the crosstabulation between inelasticity of credit demand and borrower type and confirm that risk rationed farmers are more sensitive to low interest rate. The higher the measure of inelasticity would indicate the less willingness to borrow when interest rate varies. At any given interest rates, a large proportion of risk rationed

farmers has highly inelastic demand. However, when interest rate is low enough, some risk rationed farmers have high elastic demand and are willing to borrow.

There appears to be a strongly negative relationship between formal borrowing and risk rationing. Risk rationed individuals are less likely to participate in formal markets because they are discouraged in their participation and borrowing decisions by the risk of losing collateral associated with getting formal credit. The results suggest that there is a positive and significant relationship between informal borrowing and quantity rationed farmers. This does not appear to be the case for the price rationed farmers, which has a negative and significant coefficient for informal borrowing variable. The constraint to access in formal credit markets of quantity rationed farmers causes the increasing participation in informal credit markets relative to price rationed farmers.

To capture the willingness to borrow when farmers can use their land as collateral, we find the coefficients of land use rights as collateral variable on risk rationing and price rationing are not different from zero. However, the variable is significant and negatively associated with quantity rationing. This could imply that quantity rationed farmers tend to borrow more when they can use land as collateral for a loan. In addition, we find female is more likely to be risk rationed but male is more likely to be price rationed. This is consistent with most studies indicating that women are found to be more averse to risk than men. Finally, there is no strong relationship between entrepreneurship variables and all 3 credit rationed types in the linear probability model. However, in the logit model, the coefficient of plan to start business variable is negative and significant on price rationed farmers. Farmers who plan to start business are not likely to be price rationed.

Table 3.3: Linear probability Model

	Risk Rationed		Quantity Rationed		Price Rationed	
	(1)	P>t	(2)	P>t	(3)	P>t
Sex (Female =1)	0.0390119*	0.061	0.0177828	0.528	-0.0567947*	0.097
Education	0.0074557	0.212	-0.0040498	0.637	-0.0034059	0.739
Years of Farming	0.0002039	0.804	0.0014853	0.191	-0.0016892	0.224
Farm Size (mu)	-0.0010763	0.743	0.0029848	0.594	-0.0019085	0.764
Household Income (RMB)	-8.31E-08	0.781	4.98E-07	0.573	-4.15E-07	0.649
Percent Farm Income	0.0374555	0.354	-0.0249433	0.652	-0.0125123	0.848
Asset Value (RMB)	-1.16E-09	0.274	-0.00000000392*	0.093	0.00000000508*	0.079
Saving	0.0015636	0.884	-0.0235085	0.152	0.0219448	0.253
Informal Borrowing	-0.0129207	0.54	0.1373711***	0	-0.1244504***	0.003
Formal Borrowing	-0.0638383***	0.003	-0.0220723	0.635	0.0859106*	0.088
Insurance	0.0269298*	0.062	-0.0292646*	0.057	0.0023348	0.908
Highly Inelastic_lower_i	-0.0243217	0.356	-0.0164642	0.627	0.0407859	0.329
Medium Elastic_lower_i	0.0182933	0.632	0.0300997	0.47	-0.048393	0.365
Moderate Elastic_lower_i	-0.0173542	0.722	0.0582786	0.426	-0.0409244	0.634
Highly Elastic_lower_i	0.1625621	0.164	0.2178793	0.123	-0.3804414***	0.01
Highly Inelastic_higher_i	-0.0303448	0.366	0.0115993	0.814	0.0187455	0.74
Medium Elastic_higher_i	-0.0124085	0.778	0.1249938	0.112	-0.1125852	0.189
Moderate Elastic_higher_i	-0.047337	0.271	-0.0814908	0.477	0.1288278	0.325
Highly Elastic_higher_i	-0.0604622	0.512	-0.3241685**	0.013	0.3846307**	0.017
Land Use Rights as Collateral	0.0014965	0.854	-0.0180144	0.117	0.0165179	0.224
Credit Worthy	-0.0035254	0.875	-0.1011384**	0.014	0.1046638**	0.021
Group Guarantee	-0.030602	0.297	-0.0658012	0.167	0.0964032*	0.075
Ever started business	-0.023436	0.244	0.0007093	0.982	0.0227267	0.527
Plan to start business	0.0113026	0.612	0.0528498	0.125	-0.0641524	0.105
Risk Aversion Score	0.0039919***	0.01	-0.0048225*	0.094	0.0008307	0.793
Prudence Score	0.004964**	0.029	-0.0080622***	0.008	0.0030982	0.406
Risk Aversion* Prudence	-0.0000621*	0.086	0.0001273**	0.017	-0.0000652	0.303
Constant	-0.322263**	0.012	0.5936249***	0.002	0.7286381***	0.002
Observations	575		575		575	

Note: The dependent variable for each column is listed in the column heading.

***Significant at the 1 percent level, ** 5 percent level, *10 percent level

Table 3.4: Logit Model

	Risk Rationed		Quantity Rationed		Price Rationed	
	(1)	P>z	(2)	P>z	(3)	P>z
Sex (Female =1)	0.9181063**	0.033	0.176303	0.519	-0.3649071	0.119
Education	0.1448204	0.227	-0.0395641	0.609	-0.01988	0.765
Years of Farming	0.0056551	0.732	0.0147827	0.245	-0.0119582	0.245
Farm Size (mu)	-0.0130984	0.806	0.0663359	0.294	-0.0299784	0.507
Household Income (RMB)	-9.80E-07	0.875	9.72E-06	0.193	-6.59E-06	0.279
Percent Farm Income	0.5108259	0.473	-0.1834107	0.725	-0.0671081	0.875
Asset Value (RMB)	-6.08E-07	0.27	-0.0000014*	0.053	0.00000119**	0.017
Saving	0.1213536	0.563	-0.2179932	0.266	0.1416357	0.315
Informal Borrowing	-0.3936165	0.382	1.195029***	0	-0.8351765***	0.001
Formal Borrowing	-2.262973**	0.022	-0.1483446	0.714	0.5374682	0.15
Insurance	0.4928389**	0.015	-0.2561515	0.122	-0.0100312	0.942
Highly Inelastic_lower_i	-0.4146077	0.41	-0.2017156	0.603	0.3639452	0.245
Medium Elastic_lower_i	0.3252105	0.544	0.1610179	0.712	-0.2012367	0.562
Moderate Elastic_lower_i	-0.1713025	0.875	0.2595976	0.664	-0.03266	0.951
Highly Elastic_lower_i	2.155675**	0.029	1.608991**	0.033	-2.050931**	0.011
Highly Inelastic_higher_i	-0.8140792	0.251	0.2018447	0.638	0.0485604	0.897
Medium Elastic_higher_i	-0.2118449	0.794	1.044138**	0.048	-0.746228	0.114
Moderate Elastic_higher_i	dropped	0.988	-0.8306577	0.488	1.064743	0.425
Highly Elastic_higher_i	dropped	0.991	dropped		dropped	
Land Use Rights as Collateral	0.0024396	0.643	-0.2080838**	0.041	0.1305125	0.131
Credit Worthy	0.0059218	0.418	-0.6456189**	0.033	0.5273625**	0.049
Group Guarantee	-0.3217286	0.9	-0.732953	0.307	0.8488686	0.125
Ever started business	-0.3429987	0.001	0.054649	0.858	0.1584072	0.532
Plan to start business	-0.0575772	0.001	0.4649128	0.126	-0.4644905*	0.074
Risk Aversion Score	0.1421943***	0.002	-0.0468407**	0.047	0.0060762	0.775
Prudence Score	0.1534811***	0	-0.1051185***	0.002	0.027058	0.333
Risk Aversion* Prudence	-0.0021159***		0.0015423***	0.003	-0.000489	0.268
Constant	-14.83479***		2.30034	0.152	0.8963496	0.559
Observations	563		572		572	

Note: The dependent variable for each column is listed in the column heading.

***Significant at the 1 percent level, ** 5 percent level, *10 percent level

Table 3.5: Measure of inelasticity at lower interest rates * Borrower Type Crosstabulation

		Borrower Type			
		Risk Rationed	Quantity Rationed	Price Rationed	Total
Measure of inelasticity at lower interest rates	1	4.40%	4.90%	2.10%	2.70%
	2	4.40%	18.60%	8.30%	9.50%
	3	33.30%	29.40%	23.60%	25.00%
	4	17.80%	19.60%	28.60%	26.70%
	5	40.00%	27.50%	37.40%	36.20%
Total		100.00%	100.00%	100.00%	100.00%

Table 3.6: Measure of inelasticity at higher interest rates * Borrower Type Crosstabulation

		Borrower Type			
		Risk Rationed	Quantity Rationed	Price Rationed	Total
Measure of inelasticity at higher interest rates	1		1.00%	0.50%	0.60%
	2		1.00%	1.60%	1.40%
	3	6.70%	16.70%	5.90%	7.50%
	4	8.90%	20.60%	15.80%	16.10%
	5	84.40%	60.80%	76.20%	74.50%
Total		100.00%	100.00%	100.00%	100.00%

3.9 Conclusion

The purpose of this study is to provide a specific test of risk rationing theory proposed by BCG. The farm household survey was conducted in Shaanxi province in November 2010 and 730 households were surveyed. Survey questions applied the direct elicitation methodology (DEM) and were designed so that each credit rationing status could easily be extracted.

Among all 730 respondents, the total proportion of risk rationed, quantity rationed and price rationed farmers are approximately 6.2%, 14% and 79.9% respectively. The results verify

the existence of risk rationing in China rural credit markets. There is a strong support to the theory that the financial poor is more likely to be quantity rationed. However, the result does not significantly support that the financial wealthy is more likely to be risk rationed. In addition, the productive wealth appears to have to no impact on all types of credit constraint status. We find that risk averse and prudent individuals are more likely to be risk rationed. This is likely due to innate risk judgments made by individuals. Our study is among the first that we are aware that has been able to provide evidence that in fact risk rationing behavior can take place in the presence of insurance markets. The evidence is not consistent with BCG suggesting that risk rationing occurs when insurance markets are absent. Combining the results, risk averse households tend to have a higher willingness to pay for insurance and participate in insurance markets and are more likely to be risk rationed.

Elasticity of demand for credit has a strong implication in credit markets. Results exemplify the excess demand for credit of quantity rationed farmers as quantity rationed individuals are less sensitive to high interest rate than others, but price rationed individuals are more sensitive to high interest rate and less sensitive to low interest rate. We also find that a large proportion of risk rationed farmers has perfectly inelastic of demand for credit but in fact, when interest rate is low enough, risk rationed individuals are more likely to borrow.

What have we learned from incidence of risk rationing is that efforts to enhance the working of rural credit markets and credit access in order to increase agricultural investment and alleviate poverty must also deal with risk**.** BCG argue that failure to account for risk rationed agents, who have profitable projects but are discouraged from implementing them because of the riskiness of the available loan contracts, may lead to a distortion of the rural financial system. The finding of the significance of risk rationing has practical policy implications. The interest rate subsidy and

pricing strategies designed to increase credit access might be ineffective because of the inelasticity demand for credit of risk rationed individuals. In addition, a policy to increase land use rights and security would be successful if collateral played a key role in borrowing agreements[13]. However, if credit were constrained because of risk perception, then this policy would be unlikely to reduce credit constraint. Land use rights in China will be only partially effective as it does not increase farmers' willingness to offer up the collateral needed to obtain loans. As a result, policies that decrease the risk associated with loan contract to rural households would be more appropriate in the presence of risk rationing.

[13] Stiglitz and Weiss (1992) argued that collateral and other non-price rationing devices would not eliminate the possibility of credit rationing.

3.10 Appendix

Elasticity of demand for credit variables

We create 10 binary variables to indicate characteristics of each respondent whether his credit demand is perfectly inelastic; highly inelastic, medium elastic, moderate elastic and highly elastic for lower and higher interest rate by using criteria as follows.

First, we ask a question "How much do you currently owe to RCC or Banks?". Depending on the amount of debt, each respondent then indicate the 5-level of willingness to borrow when interest rate varies in a) or b). At any given rates, a respondent indicating he would definitely not borrow anymore/less will have perfectly inelastic demand for credit. The elasticity increases as he would be willing to borrow more.

Q. How much do you currently owe to RCC or Banks? _____ RMB
If > 0 go to a), if = 0 go to b)

a) Suppose that the current RCC rate of interest is 7% per year. Assume that you can borrow as much as you need at this interest rate so that all of you credit needs are satisfied, if interest rates changed from 7% to the following rate, you would

New Interest rate %	Definitely Borrow a lot more	Definitely Borrow some more	Maybe borrow a lot more	Maybe borrow some more	Definitely not borrow anymore
6					
5					
4					
3					

New Interest rate %	Definitely Borrow a lot less	Definitely Borrow some less	Maybe borrow a lot less	Maybe borrow some less	Definitely not borrow any less
8					
9					
10					
11					

b) You indicated that you have no debt to RCC or banks. Suppose you can have all your loan needs met at the following rate. What would your borrowing activity be given the following annual interest rate?

New Interest rate %	Definitely Borrow a lot	Definitely Borrow some	Maybe borrow a lot	Maybe borrow some	Definitely not borrow any
3					
4					
5					
6					
7					
8					
9					
10					
11					

Second, we recode responses in Table a) and b) as a score. Definitely Borrow a lot more/less, Definitely Borrow some more/less, Maybe borrow a lot more/less, Maybe borrow some more/less and Definitely not borrow anymore/less take value 1, 2, 3, 4 and 5 respectively.

Third, numerical criteria are assigned as follow.

Table a) at lower interest rate (6%, 5%, 4%, 3%), maximum score = 20, minimum score = 4

Score	**Elasticity of demand for credit variables**
20	Perfectly Inelastic_lower_i = 1, otherwise = 0
16-19	Highly Inelastic_lower_i = 1, otherwise = 0
9-15	Medium Elastic_lower_i = 1, otherwise = 0
5-8	Moderate Elastic_lower_i = 1, otherwise = 0
4	Highly Elastic_lower_i = 1, otherwise = 0

Table a) at higher interest rate (8%, 9%, 10%, 11%), maximum score = 20, minimum score = 4

Score	Elasticity of demand for credit variables
20	Perfectly Inelastic_higher_i = 1, otherwise = 0
16-19	Highly Inelastic_ higher_i = 1, otherwise = 0
9-15	Medium Elastic_ higher_i = 1, otherwise = 0
5-8	Moderate Elastic_ higher_i = 1, otherwise = 0
4	Highly Elastic_ higher_i = 1, otherwise = 0

Table b) at lower interest rate (3%, 4%, 5%, 6%, 7%), maximum score = 25, minimum score = 5

Score	Elasticity of demand for credit variables
25	Perfectly Inelastic_lower_i = 1, otherwise = 0
20-24	Highly Inelastic_lower_i = 1, otherwise = 0
11-19	Medium Elastic_lower_i = 1, otherwise = 0
6-10	Moderate Elastic_lower_i = 1, otherwise = 0
5	Highly Elastic_lower_i = 1, otherwise = 0

Table b) at higher interest rate(7%, 8%, 9%, 10%, 11%), maximum score = 25, minimum score = 5

Score	Elasticity of demand for credit variables
25	Perfectly Inelastic_higher_i = 1, otherwise = 0
20-24	Highly Inelastic_ higher_i = 1, otherwise = 0
11-19	Medium Elastic_ higher_i = 1, otherwise = 0
6-10	Moderate Elastic_ higher_i = 1, otherwise = 0
5	Highly Elastic_ higher_i = 1, otherwise = 0

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CHAPTER 4

LIVELIHOOD DISRUPTION AND VENTURE CREATION: ENTREPRENEURSHIP AS TECHNOLOGY ADOPTION A COMPARISON BETWEEN SHAANXI FARMERS AND KENTUCKY FARMERS

4.1 Introduction

Starting a new business venture can involve a substantial change in work activities as well as substantial uncertainty and risk about the potential rewards and costs. Similarly a manager making a decision about whether or not to adopt a new and unfamiliar technology also faces substantial uncertainty regarding the potential costs and rewards, or how the new technology will affect the use of other inputs in the production process. By comparing the similarities in the act of venture creation and the adoption of a new technology, this study seeks to introduce the entrepreneurship model, examine factors influencing entrepreneurial adoption decision and estimate the effect of internal family events on the decision to start a new business.

Drucker (1985) defines an entrepreneur as a person who looks out for any changes, responds to it and exploits the opportunity generated by the change. It may mean provision of a new business, new product or a new service. Entrepreneurship ranges from individual projects to major activities creating many job opportunities and may involve the entrepreneur either on a full-time or part-time basis. The potential entrepreneur succeeds if the venture makes a sustainable profit (in terms of money and enjoyment) relative to other employment or business opportunities forgone. In this sense, we can think of the potential entrepreneur as involved in the joint production of profit and enjoyment. The entrepreneur may produce profit and enjoyment through some current mix of production technology, or through an entrepreneurial technology. In this way, the considerations of venture creation can be directly compared to the technology

adoption decision of a producer.

Noting the similarities between venture creation and technology adoption is important for two primary reasons. First, a long and well developed literature exists to examine the adoption and diffusion of new technologies (see Geroski (2000) for a review). This literature involves substantial rigor and much of it is devoted to empirical application and testing of candidate theories. This is in stark contrast to the literature on entrepreneurship which may be characterized as comprising many eclectic theories that are difficult to test and often supported only anecdotally. Secondly, technology adoption is an entrepreneurial activity. Thus, it is important to recognize this literature as contributing to our understanding of how entrepreneurship decisions are made and how policy may spur such activities in a way that promotes growth.

In demonstrating how the technology adoption literature may be applied to venture creation, we will employ two novel data sets consisting of a survey administered to Chinese farmers in Shaanxi province and tobacco farmers in Kentucky.

First, the entrepreneurship survey has been carried out in Shaanxi province in November 2011. The survey collected detailed information of the Chinese farmer on entrepreneurial decision and attitude toward the hypothetical implementation of land use rights transaction in China. It is interesting to see what would happen in term of the entrepreneurial decision if the Chinese government made it legal for farmers to buy or sell land use rights. The second survey collected detailed information on the socioeconomic background, entrepreneurial decision and attitude, livelihood disruption, ability levels and personality traits of the Kentucky farmer at the time of tobacco buyout. On October 22, 2004, President Bush signed the Fair and Equitable Tobacco Reform Act of 2004 (P.L. 108-357) which ended the tobacco quota program and

established the Tobacco Transition Payment Program (TTPP), also called the "tobacco buyout". The TTPP helps tobacco quota holders and producers transition to the free market by providing annual transitional payments for 10 years to eligible tobacco quota holders and producers. Kentucky is one of the most tobacco-dependent states and Kentucky tobacco farmers are particularly vulnerable to changes in tobacco economy. Farmers faced a declining return to tobacco farming and, at the same time, received a large sum of money from the government (often a lump sum) potentially encouraging farmers to consider alternative livelihoods. By utilizing the survey data of 730 Shaanxi farmers and 701 Kentucky tobacco farmers, we can explore some of the determinants of entrepreneurial intention.

The rest of this Chapter proceeds as follows. First, we briefly review the literature on technology adoption, including some discussion of the most prominent models. Second, we compare entrepreneurial attitudes between Shaanxi and Kentucky farmers. Next we propose our own conceptual model of entrepreneurship based on the technology adoption literature and several hypotheses are derived. The data and methodology are formulated in the following section. Finally, the empirical results are presented and discussed.

4.2 Learning by Doing and Learning by Using

Economists have studied the effect of entrepreneurial activities and economic activities, such as trade and Foreign Direct Investment (FDI), on economic growth. It is believed that the outcome of technology adoption in those activities creates knowledge in human capital through learning and technology diffusion which increase productivity in the economy.

4.2.1 Leaning by Doing

Arrow (1962) and Lucas (1988), both suggest that technical change is the by-product of knowledge and experience gained in the production of goods. They call this process "*learning by doing"*. The adoption of a new technology will lead to an initial change in productivity followed by some growth in productivity over time due to learning by doing.

Arrow (1962) suggests an endogenous theory of the changes in knowledge which cause inter-temporal shifts in production function. The acquisition of knowledge is usually called "learning" which is the product of experience. Learning takes place either during production or problem solving. According to the classic learning experiments, learning associated with repetition is subject to sharply diminishing returns. Thus, the stimulus situations must themselves be steadily evolving rather than simply repeating, in order to have steadily increasing performance. The role of experience in increasing productivity has been widely observed as the number of labor-hours expended in production is a decreasing function of the total number of output of the same type previously produced. Thus, there is a pronounced "learning curve" in production.

Accordingly, Arrow formulated the hypothesis that technical change in general can be ascribed to experience, that it is the activity of production which gives rise to problems for which favorable responses are selected over time. In his model, cumulative gross investment (cumulative production of capital goods) is an economic variable representing an index of "experience". Each new machine produced and put into use is capable of changing the environment in which production and learning takes place. To decide where the learning enters the production process, he assumed technical change is completely embodied in new capital

goods. The amount of labor used in production and output capacity are functions of cumulative gross investment which affect an increase in total output and productivity.

Epple et al. (1996) study transfer across shifts at manufacturing facilities over time by analyzing whether knowledge acquired through learning by doing is cumulative and persists through time or whether it depreciates. The results suggest that knowledge acquired during the period of one-shift operation carried forward to both shifts of the two-shift regime. In addition, during the two-shift regime, most learning occurred on the first shift, and most knowledge acquired on the day shift was transferred to the second shift. Irwin et al. (1994) suggest that learning by doing in the semiconductor industry is limited and evidence on spillovers is nonexistent. Tsang (2002) uses a survey of 73 Singapore and 89 Hong Kong firms with respect to their joint venture set up in China to study channels of knowledge acquisition and finds that firms improve their skills of knowledge acquisition through learning by doing.

4.2.2 Learning by Using

Another form of learning introduced by Rosenberg (1982) is *"learning by using"* which is a function not of the experience involved in producing the product but of its utilization by the final user. Intuitively, producers have learned through use of consumers how to improve quality or lower maintenance and other operating costs.

Mukoyama (2006) employs a statistical model to formulate the idea of "learning by using" as a stochastic process. Capital goods (machine) producers learn from the experience of users which leads to improvement in machine quality over time. The improvement process approximately takes an exponential form, and produces an S-shape diffusion curve of machines when combine with the growth of demand due to improvement. It is found that when the initial

quality of the machine is low, the dispersion of machine quality tends to increase first, and to decline as the machines diffuse.

Adler et al. (1991) distinguish between first-order learning and second-order learning. The concept of learning by doing is similar to the first-order learning which is learning based on repetition and on the associated incremental development of expertise which makes direct workers more effective in executing the tasks assigned to them. While, the concept of learning by using is similar to the second-order learning which is learning created by production experience and by explicit managerial or engineering action to change the technology, the equipment, the processes or the human capital in ways that augment capabilities. They find that the learning effect can be as strong in very capital-intensive operations as in labor/materials-intensive operations, which suggests the importance of learning in capital.

MacLeod (1992) explores the role of capital-goods suppliers in the innovation and diffusion of technical change. She emphasizes the type of interaction between users and capital-goods suppliers by studying the British mechanical engineering industry in 19th century and writes "... it was often only through the medium of their capital-goods suppliers that information about a new technology was passed back and forth among users (p.287)".

McWilliams et al. (1996) introduce learning by using into an adoption model to explain why larger and more educated firms adopt earlier. They integrate the concepts of adoption and diffusion by using Tobit analysis in the empirical estimation of time of adoption, which allows the diffusion of the technology to be derived from the time of adoption analysis. The study suggests that dynamic economies of scale arise in learning by using that speed up adoption.

4.3 Technology Adoption

Technology adoption is the decision by a producer to begin using a different production process in the hopes of obtaining a larger profit. Once a technology is introduced to the market, few may have any specific knowledge of how to use the technology correctly, or the levels of production that can be expected given a set of inputs. For example, studies have recently examined the adoption of genetically modified cotton seed in China (see Wang et al. 2008; Huang et al. 2002). Huang et al. find that early adopters were highly successful in reducing input costs and increasing profits leading to rapid and widespread diffusion of the new technology. More prominent examples in the literature involve the adoption of irrigation technology (Koundouri et al. 2006), large scale farm equipment (Rees, Briggs and Oakey 1984), or information technology (Williams and Rao 1997). Technology adoption can be represented by Diffusion Model and Threshold Model.

4.3.1 Diffusion Model

Technological change is a multistage process consisting of innovation, adoption and diffusion (Schmookler 1966). Once, the innovation is introduced, the technology adoption process takes time to complete. This process was the focus a many sociologists and economists. The early literature noted that plotting the rate of technology diffusion (the percent of those adopting) over time results in an S-shaped curve (see figure 4.1 in the appendix) (Davies 1979; Griliches 1957; Klepper and Graddy 1990). With an S-shaped diffusion curve, there is a relatively low adoption rate but with a high rate of change in adoption during an initial period, a period of introduction of a technology. The takeoff period is followed by a saturation period where diffusion rates are slow, marginal rate of diffusion decreases and the diffusion rate reaches

a peak. In a final period, diffusion rate and marginal rate declines and the new innovation is replaced. Diffusion tends to be concentrated geographically around cities (Baptista 1998), potentially due to the greater visibility of early adopters.

Diffusion is often modeled using the function (Sunding and Zilberman 2001):

$$P(t) = K[1+e^{-(a+bt)}]^{-1} \tag{4.1}$$

where *P(t)* is the rate of diffusion at time t, and *K* is the equilibrium rate of diffusion, *a* reflects diffusion at the start of the estimation period, *b* is the growth rate of diffusion. Based on epidemiological models, this early model of technology adoption is simple in that it does not offer any explanation of why technology is adopted. Rather the model only dictates a pattern of adoption over time. Early refinements were suggested by Quirmbach (1986) to make *K* a function of profit resulting from the new technology.

Mansfield (1963) modifies the diffusion model, supposing that diffusion is primarily a function of information transfer. His logistic curve based model is written implicitly as

$$\frac{m(t)}{n(t)-m(t)} = \frac{1}{1+e^{-(\gamma+bt)}} \tag{4.2}$$

where *m(t)* is the number of firms adopting at time *t*, *n(t)* is the total universe of firms, *b* is the growth rate of diffusion, and γ is an integration constant that positions the logistic curve on the time scale. Mansfield argues why the curve should be S-shaped. The profit from adopting new technology increases over time due to improvements in implementation of the technology, while the cost of adoption decreases, thus the rate of diffusion accelerates. Although, the Mansfield

model can explain the S-shaped curve, it disregards differences between firms by assuming that all firms are identical. In addition, while Mansfield's arguments involve dynamic aspects of technology adoption (such as lowering costs and increased profits through experience with the new technology), the model itself excludes these factors.

4.3.2Threshold Model

An alternative model is proposed by David (1969). His threshold model assumes that firms are heterogeneous, leading to different propensities to adopt a technology. Further, his model draws a distinction between adoption and the extent of adoption. He proposes two diffusion curves:

$$Y_t^1 = \frac{\int_{L_t^c}^{\infty} g(L)dL}{N} \tag{4.3}$$

$$Y_t^2 = \frac{\int_{L_t^c}^{\infty} Lg(L)dL}{\bar{L}}, \tag{4.4}$$

where, Y_t^1 is the share of farms adopting at time *t*, Y_t^2 is the share of total acres adopting the modern technology at time *t*, $L_t^c = F_t / \Delta\pi_t$ is cutoff farm size upon which adoption occurs, where F_t is fixed cost and $\Delta\pi_t$ is the profit differential per acre, *L* is farm size, *g(L)* is density of farm size, $N = \int_0^{\infty} g(L)dL$ is the total number of farms, $\bar{L} = \int_0^{\infty} Lg(L)dL$ is the total acreage.

The Threshold model potentially addresses learning-by-doing and learning-by-using. Learning-by-doing should cut the fixed costs of adopting a new technology ($\partial F_t/\partial t < 0$) through the accumulation of technology specific knowledge. Further, the profit differential

between old and new technologies will grow over time ($\partial \Delta \pi_t / \partial t > 0$) because of learning-by-using as farmers will get more yields and save cost with more experience in the use of new technology. The dynamics of diffusion associated with the threshold model will lead to an S-shaped diffusion curve.

The threshold model applies in many cases where heterogeneity results from differences in farm size, land quality or human capital. David (1969) explains the adoption of grain harvesting machinery in the United States in the nineteenth century and argues that farm size is the main source of heterogeneity among farmers. He derives the minimum farm size required for adoption of various pieces of equipment. Just et al. (1983) argue that adoption of new technology requires fixed costs associated with new machinery and a fixed investment of time for learning, locating and developing markets, and training hired labor. These fixed costs are more likely to discourage adoption by small farms and thus play a crucial role in the relationship of farm size and adoption. They suggest that risk attitudes and the stochastic relationship of returns per hectare under the traditional and modern technologies play an important role in determining the role of farm size in technology adoption.

4.4 Entrepreneurial Attitude

Previous literatures study and compare the determinants of entrepreneurship using surveys of individuals from large developed countries and developing transition countries in order understand how these groups differ in terms of individual characteristics, personality traits, perceptions of the institutional, social, and economic environment that businesses face. These factors are found to be differently associated with entrepreneurs in different countries (Djankov et al. 2006b; Ardagna et al. 2009). Therefore, we try to examine and compare entrepreneurial

characteristics and attitude of Shaanxi and Kentucky farmers to better understand their entrepreneurial uniqueness, opinion and business environment among two regions.

In each question, respondents specified their level of agreement or disagreement on a five-level Likert scale for a series of statements; “strongly disagree = 1”, “disagree = 2”, “neutral = 3”, “agree = 4”, and “strongly agree = 5”. The average values of each statement are calculated for both Shaanxi and Kentucky farmers. The higher mean would indicate that respondents are more likely to agree with a particular statement. We present a Mean Ratio calculated by dividing Shaanxi mean by Kentucky mean (Mean Ratio = Shaanxi Mean/Kentucky Mean). To compare the entrepreneurial attitudes of Kentucky farmers with Shaanxi farmer, we apply T-Test which determines whether two samples with unequal variance (heteroscedastic) are likely to have come from the same two underlying populations that have the same mean. If the P-Value is greater than 0.05, then entrepreneurial attitudes/ characteristics of two countries are similar, otherwise they are different.

Table 4.1 shows the opinion about level of support provided for new businesses in two communities. On average, we find similar opinions in the following statements. First, Shaanxi and Kentucky farmers agree that those with successful businesses get a lot of attention and admiration. Second, they are relatively neutral about bankers go out of their way to help new businesses get started. The different opinions among two regions about the level of support for new businesses are as follows. First, Shaanxi farmers agree that young people are encouraged to start their own businesses but Kentucky farmers are neutral about it. Second, Shaanxi farmers are neutral but Kentucky farmers disagree that local governments provide good support for people starting new businesses. Third, Shaanxi farmers relatively disagree but Kentucky farmers seem to be neutral about other community groups provide good support for people starting new

businesses; and the local media does a good job of covering local business news. Fourth, Shaanxi farmers are relatively neutral but Kentucky farmers agree that most of the leaders in this community are people who own their own businesses. Lastly, Kentucky farmers are more likely to agree that there are many examples of well-respected people who made a success of themselves starting new businesses.

Table 4.1: Level of support for new businesses in community

The level of support provided for new businesses in your community	Shaanxi Mean	Kentucky Mean	Mean Ratio	P>z
Those with successful businesses get a lot of attention and admiration	3.74	3.74	1.00	0.90481
Young people are encouraged to start their own businesses	3.75	2.90	1.29	0.00000
State and local governments provide good support for people starting new businesses	3.02	2.79	1.08	0.00046
Bankers go out of their way to help new businesses get started	2.84	2.81	1.01	0.46762
Other community groups provide good support for people starting new businesses	2.67	3.12	0.86	0.00000
The local media does a good job of covering local business news	2.60	3.16	0.83	0.00000
Most of the leaders in this community are people who own their own businesses	2.72	3.44	0.79	0.00000
There are many examples of well-respected people who made a success of themselves starting new businesses	3.52	3.71	0.95	0.00006

Next, we asked respondents "Imagine that you have decided to start a new business. Please indicate how accurately you think the following statements would describe each possible start-up problem your new business might face." On average, both Shaanxi and Kentucky farmers have different opinions on all statements concerning start-up problems. Kentucky farmers are more likely to agree that being taken seriously as a business person and balancing time between business and personal or family time are the possible start-up problems they might

face. However, Shaanxi farmers are more likely to agree that their start-up problem is lacking of mentors or a support structure who can provide advice and support. Table 4.2 presents the attitudes of Shaanxi and Kentucky farmers about possible start-up problems.

Table 4.2: Possible start-up problems

Each possible start-up problem your new business might face (Imagine that you have decided to start a new business)	Shaanxi Mean	Kentucky Mean	Mean Ratio	P>z
Start-up Problem: Being taken seriously as a business person	2.99	3.21	0.93	0.00006
Start-up Problem: Balancing time between business and personal or family time	3.46	3.61	0.96	0.00560
Start-up Problem: Lack of mentors or a support structure who can provide advice and support	3.35	3.22	1.04	0.01888

Table 4.3 indicates mean of farmers' attitude about the certainty of their new business accomplishment. The results from T-test show that on average Shaanxi farmers and Kentucky farmers have different views about the certainty of new business accomplishment. Kentucky farmers are more likely to agree that they will be able to accomplishment in 1) Obtain raw materials, 2) Deal with distributors, 3) Attract customers, 4) Compete with other businesses, 5) Keep up with technological advances, and 6) Obtain a bank financing. However, Shaanxi farmers are more likely to agree about the accomplishment in attracting employees, and complying with local, state & federal regulations. Kentucky farmers are relatively neutral but Shaanxi farmers relatively disagree that they will be able to accomplish in obtaining start-up capital and working capital. Finally, Shaanxi farmers are more likely to disagree that they will be able to obtain venture capital financing.

Table 4.3: The certainty of new business accomplishment

How certain you are that your new business will be able to accomplish each of the following	Shaanxi Mean	Kentucky Mean	Mean Ratio	P>z
Obtain raw materials	3.13	3.32	0.94	0.000709
Attract employees	3.31	3.16	1.05	0.010015
Obtain start-up capital	2.70	2.99	0.90	0.000002
Obtain working capital	2.55	3.00	0.85	0.000000
Deal with distributors	2.84	3.38	0.84	0.000000
Attract customers	3.05	3.36	0.91	0.000009
Compete with other businesses	2.93	3.22	0.91	0.000000
Comply with local, state & federal regulations	4.02	3.43	1.17	0.000000
Keep up with technological advances	2.86	3.34	0.86	0.000000
Obtain a bank financing	2.35	3.25	0.72	0.000000
Obtain venture capital financing	2.13	2.86	0.74	0.000000

Further, we examine farmers' attitudes about their entrepreneurial abilities and business situation among two regions. Lazear (2004) uses the survey data of Stanford University MBA graduates and concludes that individuals who become entrepreneurs have a special ability to acquire general skills applying to their own businesses. Entrepreneurial abilities and business situation in two communities are presented in Table 4.4.

Results show that Shaanxi and Kentucky farmers have different opinions about their entrepreneurial abilities and business situation. Kentucky farmers are more likely to agree that 1) If I work hard, I can successfully start a new business, 2) Overall, my skills and abilities will

help me start a business, and 3) My past experience will be very valuable in starting a business. On the contrary, Shaanxi farmers are more likely to agree that they can put in the effort needed to start a business but they are more likely to disagree that several new companies opened in their community in the last three years. Finally, Kentucky farmers are more likely to disagree that they will have to move to another community if they want to start a new business.

Table 4.4: Entrepreneurial abilities and business situation in community

Imagine that you have decided to start a new business. Please indicate the extent to which you agree or disagree with each statement.	**Shaanxi Mean**	**Kentucky Mean**	**Mean Ratio**	**P>z**
If I work hard, I can successfully start a new business	3.54	3.75	0.94	0.00002
Overall, my skills and abilities will help me start a business	3.72	3.93	0.95	0.00000
My past experience will be very valuable in starting a business	3.79	3.96	0.96	0.00010
I am confident I can put in the effort needed to start a business	3.90	3.67	1.06	0.00000
Several new companies opened in my community in the last three years	2.24	2.94	0.76	0.00000
I will have to move to another community if I want to start a new business	2.81	2.51	1.12	0.00000

Table 4.5 presents attitude about business activity in community. We find that on average farmers in two countries have different attitudes about business activity in their community as follows. First, Shaanxi farmers disagree that many new people moved into my community in the last three years while Kentucky farmers agree with this statement. Second, Kentucky farmers disagree that many people in their community start new businesses but Shaanxi farmers seems to be neutral about it. Third, Shaanxi farmers agree that people in their community often talk about new business opportunities but Kentucky farmers neither agree nor disagree with this statement. Lastly, Shaanxi farmers disagree that local government official suggests new business

possibilities but Kentucky farmers are relatively neutral about it.

Table 4.5: Business activity in community

Business activity in your community	Shaanxi Mean	Kentucky Mean	Mean Ratio	P>z
Many new people moved into my community in the last three years	2.06	3.54	0.58	0.00000
Many people in my community start new businesses	2.84	2.54	1.12	0.00000
People in my community often talk about new business opportunities	3.20	2.94	1.09	0.00000
Local government official suggests new business possibilities	2.43	3.08	0.79	0.00000

Finally, we investigate and compare entrepreneurial characteristics between Shaanxi and Kentucky farmers. They have similar agreement on the following statements. They both agree that when they get what they want, it is usually because they worked hard for it. Second, they have been very impressed with the people they know who have their own business. However, Shaanxi and Kentucky farmers have different entrepreneurial characteristics as follows. First, Kentucky farmers are more likely to agree that 1) they are successful in completing new tasks, 2) they can reach goals they set for themselves, 3) they are successful when confronting obstacles, 4) they can do anything they set my mind to, 5) they have no trouble making and keeping friends, 6) when they make plans they are almost certain to make them work 7) they usually know what is appropriate in any social situation, and 7) they are a good judge of character. Second, Shaanxi farmers are more likely to agree that they would be proud of their children if they started their own business. Third, Kentucky farmers disagree with these two statements "owning my own business is more important than spending time with my family", and "I consider myself a loner" but Shaanxi farmers are neutral. Fourth, Kentucky farmers agree that they would probably choose the same career path again but Shaanxi farmers are relatively

neutral. Lastly, Shaanxi farmers relatively disagree that they are often concerned about what others think of them but Kentucky farmers seems to be neutral. Table 4.6 presents the mean entrepreneurial characteristics of Shaanxi and Kentucky farmers.

Table 4.6: Entrepreneurial characteristics of Shaanxi and Kentucky farmers

Respondent's characteristics	Shaanxi Mean	Kentucky Mean	Mean Ratio	P>z
I am successful in completing new tasks	3.71	4.12	0.90	0.00000
I can reach goals I set for myself	3.69	4.12	0.90	0.00000
I am successful when confronting obstacles	3.50	4.01	0.87	0.00000
I can do anything I set my mind to	3.60	3.97	0.91	0.00000
Owning my own business is more important than spending time with my family	3.19	2.01	1.59	0.00000
I have no trouble making and keeping friends	3.82	3.96	0.96	0.00202
When I make plans I am almost certain to make them work	3.56	3.88	0.92	0.00000
When I get what I want, it is usually because I worked hard for it	3.94	4.13	0.96	0.05090
I would be proud of my children if they started their own business	4.33	4.21	1.03	0.00813
I have been very impressed with the people I know who have their own business	3.81	3.87	0.98	0.14953
I would probably choose the same career path again	2.87	3.65	0.78	0.00000
I usually know what is appropriate in any social situation	3.48	3.86	0.90	0.00000
I consider myself a loner	2.64	2.32	1.14	0.00000
I am often concerned about what others think of me	2.62	3.10	0.84	0.00000
I am a good judge of character	3.43	3.95	0.87	0.00000

4.5 Determinants of Entrepreneurial Intention

Economists and sociologists have made extensive contributions to the literature on the adoption and diffusion of technological innovations in agriculture (see Feder et al. (1985); Rogers (1995)). Such research typically focuses on the long-term rate of adoption and the factors that influence the adoption decision. The perceived or real characteristics of a new innovation are widely known to influence the adoption decision. Rogers (1995) hypothesizes five technology attributes that affect the rate of adoption: 1) relative advantage (i.e., profitability, initial cost, status, time savings, and immediacy of payoff over conventional practice); 2) compatibility (i.e., similarity with previously adopted innovations); 3) complexity (degree of difficulty in understanding and use); 4) trialability (i.e., ease of experimentation); and 5) observability (i.e., degree to which the results of the innovation are visible). These factors might also affect entrepreneurial adoption decision, for example; new venture expected profit over profit of current activity, ease of entrepreneurial activity and business process, and observable profit and result of other entrepreneurs.

We draw an analogy between factors affecting technology and entrepreneurial adoption and investigate whether Shaanxi and Kentucky farmers are influenced by different factors when making decisions to enter entrepreneurship. Literature reported a number of determinants of entrepreneurial activities. In this section some of the determinants are reviewed.

Demographic factors

Demographic factors include age, ethnicity, and the changes in regular family structure such as death and divorce are found to have a significant impact on entrepreneurial intention. Ardagna et al. (2009) show that individual characteristics, such as gender and age are important determinants of entrepreneurship. Pushkarskaya (2008) suggests the family structure and internal

family events, such as death of a household member or divorce, strongly influence the decision to start a new business.

Economic Factors, Farm Structure/Size

The technology adoption requires a large initial investment. Farmers use some of their own income and equity to finance at least part of their investments. However, low income, unemployment, fear of job loss, or dissatisfaction with the previous job are considered main "push" motives for entering entrepreneurship (Brockhaus (1980); Cromie et al. (1991)). In addition, a basic hypothesis regarding technology transfer is that the adoption of an innovation will tend to take place earlier on larger farms than on smaller farms. Just et al. (1980) note that given the uncertainty, and the fixed transaction and information costs associated with innovations, there may be a critical lower limit on farm size that prevents smaller farms from adopting. As these costs increase, the critical size also increases. It follows that innovations with large fixed transaction and/or information costs are less likely to be adopted by smaller farms.

Shaanxi and Kentucky farmers are particularly vulnerable to policy changes in the economy. Thus, many farmers have to adjust to the new economic conditions and are likely to experience the changes of income and business environment. In the analysis, we include income level, land size, and business climate variables which may significantly correlate with technology and entrepreneurial adoption. Moreover, variables indicating the receipt of a tobacco buyout check and availability of payment options are included in Kentucky farmers' entrepreneurial study.

Human Capital

The ability to adapt new technologies for use on the farm clearly affects the adoption decision. Most adoption studies attempt to measure this trait through operator age, formal

education, or years of farming experience, see Fernandez-Cornejo et al. (1994). More years of education and/or experience is often hypothesized to increase the probability of adoption whereas increasing age reduces the probability. Younger farmers tend to have higher education and are often hypothesized to be more willing to adopt an innovation. Prior research indicates that educational level strongly correlates with self-employment. In this study, the human capital variables consist of education level, internet access and having computer at home. The difference in human capital i.e. education and knowledge-based learning may have a significant influence in entrepreneurial adoption.

Social network and Learning

The agricultural community may establish customs and other social and institutional arrangements for mutual help in technology adoption. Smaller farms may also increase their adoption because of social and government support. Individual who has a strong tie within social network and knows other entrepreneurs is more likely to start the new business. Renzulli et al. (2000) explore social capital and the likelihood of starting a business and find that networks across multiple areas of social life obviously provide nascent entrepreneurs with greater access to multiple sources of information than do more homogeneous networks and thus enable them to make the transition from idea to action. Moreover, Djankov (2006a) uses data from 7 cities across China and finds that entrepreneurs are more likely to have family members who are entrepreneurs as well as childhood friends who became entrepreneurs, suggesting that social networks play an important role in entrepreneurship. In addition, Raffo et al. (2000) suggest that micro and small enterprises (MSEs) in the cultural industries sector learn best by being able to experiment with ideas, by "doing" and networking with others and by working with more experienced mentors in their sector.

Distance and geography

The role of distance and geography in technology adoption is emphasized in the social science literature on innovation, Rogers (1995). The emergence of a national media and the reduction in the cost of access that resulted from the establishment of railroads, the interstate highway system, and rural electrification is one of the reasons for the faster rate of technological adoption in the US. Producers living farther away from a regional center are likely to adopt technologies and new venture later.

Tenure

Land ownership is generally believed to encourage adoption of technologies associated with land. While several empirical studies support this hypothesis, the results are not consistent and the subject has been widely debated. For example, Bultena et al. (1983) find that land tenure has no significant influence on adoption of conservation tillage. The apparent inconsistencies in the empirical results are due to the nature of the innovation. Land ownership is likely to influence adoption if the innovation requires investments tied to the land. Apparently, tenants are less likely to adopt these types of innovations because they perceive that the benefits of adoption will not necessarily accrue to them.

Credit constraint

Evans et al. (1989) argue that capital is essential for starting a business and suggest that liquidity constraint will prevent some people from trying entrepreneurship. The similar conclusion is found in the study by Holtz-Eakin et al. (1994) suggesting that liquidity constraints exert a noticeable influence on the feasibility of entrepreneurial enterprises. Even though, several studies report the evidence that liquidity constraints are a prevention to new business formation, but Hurst et al. (2008) argue that this conclusion is premature. They provide evidence

that high levels of liquidity are not essential for starting a small business and the survival of businesses is not affected by the wealth of the entrepreneurs. They conclude, however, that even if some households that want to start small businesses are currently constrained in their borrowing, such constraints are not empirically important in deterring the majority of small business formation in the United States.

Attitude toward Risk

Previous literatures find that attitude toward risk is significantly associated with technology adoption and business start-up. Knight (1921) argues that bearing risk is one of the essential characteristics of entrepreneurship. In addition, Djankov et al. (2006a) suggest that entrepreneurs differ strongly from non entrepreneurs in their attitudes towards risk and their work-leisure preferences. They find that entrepreneurs are more willing to take risks.

Hypotheses

Along with previous studies, the hypotheses of factors affecting entrepreneurial adoption decision are formulated as follows;

Demographic factors

H1: Age, white (race of farmers in Kentucky), death, and divorce are strongly correlated with entrepreneurial intentions.

Economic factors

H2: Low income can "push" individuals into starting new businesses.

H3: Farm size and business climate are strongly correlated with entrepreneurial intentions.

Human capital

H4: Education level, computer and internet access are positively associated with entrepreneurial

intentions.

Social network and Learning

H5: Social network, learning by doing and learning by using significantly affect entrepreneurial intentions.

Distance and geography

H6: Urban community and distance from university or college are significantly correlated with entrepreneurial intentions.

Tenure

H7: Rent (acres of land that farmers rent) which is a proxy of tenure significantly correlates with entrepreneurial intentions.

Credit constraint

H8: Risk rationed and quantity rationed individuals are less likely to become entrepreneurs.

Attitude toward risk

H9: Agents who are risk averse and prudent are less likely to start new business.

4.6 A Conceptual Model of Entrepreneurship

Studies of technology adoption behavior focus on factors that affect if and when a particular individual will begin utilizing an innovation. The purpose of this study is to identify the determinants of entrepreneurial adoption decisions. This section sets out a simple model of an individual farmer's decision of whether or not to participate in entrepreneurial activity that we use to guide our empirical work. We modify the threshold models that focus on studies of the adoption behavior of individual farmers and a search for sources of heterogeneity. In the existing approach, the dependent variables denote whether or not certain technologies are adopted by a

farm product or unit at a certain period, and econometric techniques like logit or probit are used to explain discrete technology choices. Similarly, the dependent variables in our model denote whether or not entrepreneurial activities are adopted by Shaanxi farmers if the transaction of land use rights is implemented and by the tobacco farmers at the time after the tobacco buyout program in 2004. A bivariate probit model is applied to explain binary entrepreneurial choices.

Adoption behavior is depicted by a discrete choice, whether or not to start new business, and a continuous choice, how much time or resources to devote to the new activity. Formally, we suppose that adoption of entrepreneurship depends both on the profitability of current ventures versus potential entrepreneurial ventures, and the degree of learning by doing. Here heterogeneity in learning by doing, or knowledge generated by direct or indirect experience, is determined by the degree to which the individual is connected to an entrepreneurial social network. Formally, let *S* be the degree to which an individual is integrated into a network of individuals or institutions that have created ventures. Consider an individual facing a choice between continuing in their current employment and earning π_0, or starting an entrepreneurial activity and earning some random profit π_e with some known distribution. The individual thus will solve

$$max_{t\in[0,1],T} U\big(\pi_0(\theta,(1-t),T)\big) + EU(\pi_e|S,\theta,t,T), \tag{4.5}$$

where *t* is the percentage of working time devoted to the entrepreneurial activity, *T* is leisure time, *U* is a standard utility of wealth function, θ are personal and property characteristics that can influence one's ability to obtain profit in either activity (e.g., education, location, etc.) and $EU(\pi_e|S,\theta,t,T) = \int_{-\infty}^{\infty} U(\pi_e) f\,(\pi_e|S,\theta,t,T) d\pi_e$, is the subjective expected utility of profit in the new venture given the degree of learning by doing, learning by using, the personal

characteristics and the time devoted to the new activity. Learning by doing and learning using may raise both the mean and lower the variation associated with π_e, as the individual obtains specific knowledge not only about how to begin and run one's own venture, but also learns more about the potential market for new products or services. Thus, $\partial EU(\pi_e|S,\theta,t,T) \,/\, \partial S > 0$. Denote total time $\bar{T} = \lambda t + (1-\lambda)T$, where $\lambda \in [0,1]$. Three possible solutions exist for (4.5). The first order conditions for an internal solution to (4.5) is given by

$$-U'\big(\pi_0(\theta,(1-t),T)\big)\pi_{02} + \int_{-\infty}^{\infty} U(\pi_e) f_t\,(\pi_e|S,\theta,t,T)d\pi_e = 0, \tag{4.6}$$

where π_{02} is the derivative of profit in the initial activity with respect to time devoted to that activity, and f_t is the derivative of the probability density function of profit for the new activity with respect to time devoted to this activity. Equation (4.6) will imply the optimum if (4.6) can hold for some $t \in (0,1)$. Alternatively, the individual will not engage in entrepreneurship if

$$-U'\big(\pi_0(\theta,1,T)\big)\pi_{02} + \int_{-\infty}^{\infty} U(\pi_e) f_t\,(\pi_e|S,\theta,0,T)d\pi_e < 0, \tag{4.7}$$

where (4.7) is the first order condition with time in entrepreneurship replaced with 0. The individual will completely abandon the old activity if

$$-U'\big(\pi_0(\theta,0,T)\big)\pi_{02} + \int_{-\infty}^{\infty} U(\pi_e) f_t\,(\pi_e|S,\theta,1,T)d\pi_e > 0, \tag{4.8}$$

and if $$EU(\pi_e) > U(\pi)$$

where now time in entrepreneurship has been replaced with 1. Thus, the degree to which one is socially connected to entrepreneurship will both increase the likelihood of being an entrepreneur, and increase the probability of abandoning other activities altogether. Further, factors that

decrease the profitability of the old activity will increase the likelihood of entering entrepreneurial ventures. For this reason we expect an event such as the tobacco buyout and land use rights transaction to spur new entrepreneurship at some level.

A bivariate probit model was used in both Shaanxi and Kentucky cases. First, consider a rational farmer in Kentucky that seeks to maximize the present value of benefits from tobacco production and expected benefits from a new business venture. Two decisions were made by the same Kentucky farmer and those two decisions are interrelated. First, the Kentucky farmer has to decide whether or not to continue growing tobacco and second, the farmer decides whether or not to engage in entrepreneurial effort. The time devoted to a tobacco farm and new venture is subject to a utility maximization of both tobacco farm profit and new venture expected profit as in equation (4.5). The probability of quitting tobacco farming is determined by the livelihood disruption of a tobacco buyout program and characteristics of farmers which affect a tobacco producer's profit. While, the likelihood to engage in entrepreneurship is determined by farmers characteristics as well as social network which affect an expected profit of new venture.

Farmers are assumed to make adoption decisions based upon an objective of utility maximization. The first term in equation (4.5) can be represented as a utility maximization of tobacco farm profit;

$$U_i^* = U(\pi_{0i}(\theta_i, (1 - t_i), T_i; u_i)) \tag{4.9}$$

where U_i^* is a maximized utility function of Kentucky farmer *i* growing tobacco farm, U_A is an alternative activity. Denoting z_i as the observed binary variable of farmer *i* equal to 1 if a farmer does not plan to raise tobacco in the future, otherwise, it equals to 0, we have:

$$z_i = \begin{cases} 1 \; if \; U_i^* \leq EU(\pi_{ei}|S_i, \theta_i, t_i, T_i), U_A \\ 0 \; if \; U_i^* > EU(\pi_{ei}|S_i, \theta_i, t_i, T_i), U_A \end{cases} \tag{4.10}$$

Farmers evaluate whether or not to quit tobacco farm. When the discounted expected benefits of

adoption (entrepreneurial activities) are greater than the benefits of tobacco farming, the new venture will be adopted.

The second term in equation (4.5) can be represented as an expected utility maximization of entrepreneurial profit;

$$EU_i^* = EU(\pi_{ei}|S_i, \theta_i, t_i, T_i; \varepsilon_i) = \int_{-\infty}^{\infty} U(\pi_e) f(\pi_e | S_i, \theta_i, t_i, T_i; \varepsilon_i) d\pi_e \qquad (4.11)$$

where EU_i^* is an expected maximized utility function of Kentucky farmer *i* engaging in new venture. The farmer *i* makes a decision whether or not to start a new business, regardless of quitting tobacco farm. The observable choices are y_i equal to 1 if farmer *i* plan to start a new business and 0 otherwise.

$$y_i = \begin{cases} 1 \; if \; EU_i^* > U(\pi_{0i}(\theta_i, (1 - t_i), T_i)), U_A \\ 0 \; if \; EU_i^* \leq U(\pi_{0i}(\theta_i, (1 - t_i), T_i)), U_A \end{cases} \qquad (4.12)$$

His expected profit of new venture compared to benefits from tobacco production affect decision whether or not to engage in entrepreneurship.

Net benefits U_i^* and EU_i^* are assumed to be random functions of vectors of exogenous variables X_1 and X_2, respectively,

$$U_i^* = X_{1i}\beta_1 + u_i \qquad EU_i^* \cong X_{2i}\beta_2 + \varepsilon_i \qquad (4.13)$$

where u_i and ε_i are random errors assumed to be independently and normal distributed with zero mean and variance one. β_1 and β_2 are vectors of unknown parameters.

The system of equations (4.10) and (4.12) should be estimated using a bivariate probit procedure. This is because when the random factors affecting the two decisions are not independent because of unobserved factors that could affect both decisions, then $corr(\varepsilon_i, u_i) = \rho$. In this case, the disturbances of the two selection equations (4.10) and (4.12) have a bivariate

normal distribution with mean vector zero and covariance matrix $\Sigma = \begin{bmatrix} 1 & \rho \\ \rho & 1 \end{bmatrix}$, Hausman et al. (1978). A joint (simultaneous) decision model with a four way classification of observations into the following groups would result: $(z_i = 1,\ y_i = 1)$, $(z_i = 1,\ y_i = 0)$, $(z_i = 0,\ y_i = 1)$ and $(z_i = 0,\ y_i = 0)$. This four-way grouping of observations with a nonzero ρ leads to a bivariate model with the probabilities of the four outcomes;

$$P_{zy} = \Pr(z_i = 1, y_i = 1) \tag{4.14}$$

$$= \Phi_2[EU(\pi_{ei}|S_i, \theta_i, t_i, T_i) - X_{1i}\beta_1,\ X_{2i}\beta_2 - U(\pi_{0i}(\theta_i, (1 - t_i), T_i)), \rho]$$

$$P_{zo} = \Pr(z_i = 1, y_i = 0) \tag{4.15}$$

$$= \Phi\big(EU(\pi_{ei}|S_i, \theta_i, t_i, T_i) - X_{1i}\beta_1\big) - \Phi_2[EU(\pi_{ei}|S_i, \theta_i, t_i, T_i) - X_{1i}\beta_1,\ X_{2i}\beta_2$$

$$-U(\pi_{0i}(\theta_i, (1 - t_i), T_i)), \rho]$$

$$P_{oy} = \Pr(z_i = 0, y_i = 1) \tag{4.16}$$

$$= \Phi(\ X_{2i}\beta_2 - U(\pi_{0i}(\theta_i, (1 - t_i), T_i)) - \Phi_2[EU(\pi_{ei}|S_i, \theta_i, t_i, T_i)$$

$$- X_{1i}\beta_1,\ X_{2i}\beta_2 - U(\pi_{0i}(\theta_i, (1 - t_i), T_i)), \rho]$$

$$P_{oo} = \Pr(z_i = 0, y_i = 0) \tag{4.17}$$

$$= 1 - \Phi\big(EU(\pi_{ei}|S_i, \theta_i, t_i, T_i) - X_{1i}\beta_1\big) - \Phi\Big(\ X_{2i}\beta_2 - U(\pi_{0i}(\theta_i, (1-t_i), T_i)\Big)$$

$$- \Phi_2[EU(\pi_{ei}|S_i, \theta_i, t_i, T_i) - X_{1i}\beta_1,\ X_{2i}\beta_2 - U(\pi_{0i}(\theta_i, (1 - t_i), T_i)), \rho]$$

where $\Phi(.)$ and $\phi_2(.)$ are the cumulative density function of the standard normal distribution and the standard bivariate normal distribution with correlation coefficient ρ, respectively. Equation (4.10) and (4.12) allow us to derive several testable implications, and set out the determinants of entrepreneurial intention.

Similarly, the above model is also applied with Shaanxi farmers who seek to maximize the present value of benefits from farm production and expected benefits from a new business venture. Two decisions were made by the same Shaanxi farmer and those two decisions are interrelated. First, the Shaanxi farmer has to decide whether or not to buy or sell land use rights and second, the farmer decides whether or not to engage in entrepreneurial effort.

The first term in equation (4.5) can be represented as a utility maximization of farm profit; where U_i^* is a maximized utility function of Shaanxi farmer *i* growing crop farm, U_A is an alternative activity. Denoting z_i as the observed binary variable of farmer *i* equal to 1 if a farmer plan to sell land use rights, otherwise, it equals to 0. The model structure of Shaanxi farmers also follows equation (4.10) – (4.17). Finally, we are able to compare entrepreneurial results between Shanxi and Kentucky farmers.

4.7 Survey and Data

The unique data for this study were collected through surveys from two regions. The first farm household survey was conducted in Shaanxi province, Yangling district in November 2010 with 730 respondents. Each household was interviewed by either one or two graduate students from Northwest Agriculture and Forestry University. The survey itself dealt exclusively with entrepreneurial intention, attitude and transaction of land use rights. We specifically asked farmers if the Government made it legal for farmers to buy or sell land use rights, would you buy or sell land use rights?, and are you planning to start a new business?

The characteristics of these communities are as follows. The average age of respondents is approximately 49 years old and the average education level of respondents is between attending middle school and completing middle school. On average there are about 5 people

living in each household. The average number of years farming is 28 years, and the average farm size is 5mu (about 5/6th of an acre). Household income average is 23,796 RMB/year with approximately 39% of household income coming from farm activities. The average profit per year earned from cropped land is 953 RMB/mu. The average asset per household is 318,904 RMB. There are 203 farmers indicating the amount of their debt and the average debt per household is 29,330 RMB.

In addition, there are 295 farmers or about 41 percent who plan to start new business. Of all 730 farmers, there are 210 farmers who want to sell land use rights; 240 farmers want to buy land use rights and 280 farmers want to do nothing. Approximately 60 percent of Shaanxi farmers personally know people who started their own business in a community or elsewhere but only 16 percent of Shaanxi farmers participate in social groups.

The similar farm household survey was conducted in Kentucky from the summer of 2005 through the fall of 2006 which is the time that tobacco farmers received their first buyout checks. During this period, tobacco farmers adjusted to the new environment and decided whether to involve in the entrepreneurial activities. Seven hundred one individuals in Kentucky were surveyed. Approximately 45 percent of farmers in both groups had income in the range of $30,000 – $79,999. The majority in both groups owned or rented the land size of less than 499 acres and finished college education. In addition, about 80 percent of tobacco farmers in both groups participated in social groups. There are 101 farmers who planned to start new business, and 568 farmers did not plan to start new business.

List of the dependent and independent variables as well as survey questions is shown in Table 4.8 in the Appendix. The dependent variable in the outcome equation of a biprobit model is “Entrepreneur” variable indicating farmer’s decision to start new business. The dependent

variable in a selection equation is “Sell land use rights” for Shaanxi farmers and “Quit tobacco farm” for Kentucky farmers. Independent variables consist of various factors that might be related to entrepreneurial intention. First, demographic factors include age, ethnicity, and the changes in regular family structure such as death and divorce. Second, economic factors comprise income level, farm size, business climate, Kentucky farmer’s buyout check and payment option. Third, we include education level, having computer, and internet access as human capital factors. Fourth, social network and learning factors used in the analysis are as follows. Variables as a measure of social network are, 1) “know entrepreneurs” dummy variable indicates whether a farmer knows other entrepreneurs, 2) “social group” dummy variable shows whether a farmer participate in any social groups, and 3) “loner” variable is farmer’s characteristics opposed to social network. Learning factors can be divided to Learning by doing and Learning by using. Learning by doing in technology adoption is comparable to prior experience with other entrepreneurs, whereas; learning by using is the information obtained from other entrepreneurs. Learning by doing is measured by two variables, 1) “good support” variable shows level of farmers’ agreement with the statement “other community groups provide good support for people starting new businesses.”, and 2) “past experience” variable indicates the extent to which farmers agree or disagree with the statement “My past experience will be very valuable in starting a business”. We include two variables as a measure of learning by doing, 1) “success entrepreneur example” variable indicates whether there are many examples of well-respected people who made a success of themselves starting new businesses in their community, and 2) “talk about new business” variable presents whether people in their community often talk about new business opportunities. Furthermore, “keep up technology” variable showing farmer’s level of certainty that their business will be able to keep up with technology advances and “start

up problem" variable are included. Fifth, distance and geography factors include "urban" dummy variable and "distance" variable. In Kentucky, distance variable represents miles from farmer's home to nearest school. In Shaanxi, distance takes value 1 if farmer's village is located further away from Xi'an city, and value 0 if it is located near Xi'an city. Sixth, tenure factor is represented by "rent" dummy variable taking value 1 if area of rented farm is greater than that of owned farm, and value 0 otherwise. Seventh, credit constraint factors include dummy variables of price rationed farmers and quantity rationed farmers. The definition of risk rationed and quantity rationed farmers are presented in Chapter 3. Finally, attitude toward risk factors are measured by risk aversion score and prudence score variables. The explanation of risk aversion and prudence score estimation are presented in Chapter 2.

4.8 Results

Using bivariate probit specification, a maximum likelihood was used for estimation. Estimates are exhibited in Table 4.7. We find three factors have a significant impact on venture creation of both Shaanxi and Kentucky farmers. First, age of respondents is strongly associated with entrepreneurial intention for both Shaanxi and Kentucky farmers. Shaanxi and Kentucky farmers with the age less than 54 are the most entrepreneurial adopters. This is consistent with previous finding that younger agents are more likely to start new business and take more risk relative to older farmers.

Second, death of a family member has a significant impact on entrepreneurial decision. On average, an exogenous shock in the family reduces the probability of running new business for Shaanxi farmers. In contrast, Kentucky farmers who experience death in their household within the last three years are more likely to create a new venture.

Third, learning by doing factor is strongly associated with entrepreneurial intention. We find that both Shaanxi and Kentucky farmers are more likely to start new business if they agree that their past experience will be very valuable in starting a business.

Several factors affecting venture creation are different between two regions. In Shannxi, factors that are also strongly associated with entrepreneurial decision are business environment, human capital and social network. First, if Shaanxi farmers perceive that the business climate is getting worse compared to last year, the probability of being entrepreneurs will increase. Second, it is surprising that farmers with high education have a lower probability to become entrepreneurs. High-educated farmers should have knowledge and more opportunity to explore in ways that interest them. Nevertheless, as they know more, they might be less willing to take risk. Third, having a computer at home which is a proxy of human capital is a factor affecting Shaanxi farmer's entrepreneurial decision but it is not supported in Kentucky study. Shaanxi farmers who have a computer at home are more likely to start new business. Fourth, social network factor is found to be related to business start-up in Shaanxi. Knowing people who started their own business in a community has a positive relationship to the entrepreneurial decision, which supports our hypothesis. The coefficient of the variable is positive and significant. Farmers who know other entrepreneurs are more likely to be supported in entrepreneurial activities in a community. Individuals will transfer business know-how, experience, expertise and advanced technology to each other which encourage learning and increase knowledge in human capital and thus productivity growth. However, income, credit constraint and attitude toward risk are not significantly correlated with Shaanxi farmer's entrepreneurial decision.

In Kentucky, other 4 variables, namely low income, ethnicity, payment option and start up problem have a significant relation with the decision of whether or not entrepreneurial activities are adopted. First, the income less than $29,999 is significant at 1 percent indicating farmer with low income is more likely to start a new business. This finding supports the "push" hypothesis as farmers with low income are pushed into starting a new business. The result is consistent with the study by Pushkarskaya (2008) stating that low income significantly correlates with entrepreneurial intentions. Pushkarskaya found that farmers with household incomes less than $29,999 were two times more likely to start a new business than farmers with incomes greater than $30,000. However, the result is not consistent with Evans and Jovanovic (1989) that examine whether a person have to be wealthy before he can start a business. They show that wealthier people are more inclined to become entrepreneurs. Moreover, Hurst and Lusardi (2008) show that the survival of businesses is not affected by the wealth of the entrepreneurs. Second, concerning ethnicity and livelihood disruption, results in Kentucky show that white farmers are less likely to start new business. Third, farmers who received tobacco buyout checks by choosing single lump sum payment option tend to become entrepreneurs. This is likely to be the case that farmers can use a large amount of money they received to start a new business. Finally, start up problem variable is decreasing with probability of being entrepreneurs. As expected, Kentucky farmers who have more start up problem are less likely to create business venture.

Table 4.7: Bivariate Probit Results

Bivariate Probit (Outcome Equation)

	Shaanxi		Kentucky	
	Coefficient	**P>z**	**Coefficient**	**P>z**
Entrepreneur				
age <35	1.9064***	0.000	1.3678**	0.010
age 35-54	1.1875**	0.011	1.1882***	0.009
age 55-64	-0.1055	0.823	0.6747	0.139
White			-0.8937*	0.066
Death	-0.3527*	0.096	0.7061***	0.001
Divorce	0.3222	0.595	0.2994	0.535
Low income	0.0322	0.903	0.7457*	0.079
Medium income	-0.1795	0.449	0.0704	0.792
High income	0.0138	0.956	0.3700	0.234
Land	0.0765	0.667	0.0817	0.725
Buyout check			0.0000	0.191
Payment option			0.5532**	0.045
Business Climate	-0.2305*	0.060	-0.1429	0.428
Education	-0.1071**	0.049	0.0958	0.196
Computer	0.8698**	0.020	-0.5184	0.242
Internet	-0.2705	0.509	0.5131	0.164
Know entrepreneurs	0.5023***	0.008	-0.3413	0.229
Social group	0.2682	0.211	0.0644	0.873
Loner	-0.0561	0.412	-0.0548	0.571
Good support	-0.0076	0.924	-0.0177	0.892
Past experience	0.1965**	0.045	0.3496*	0.058
Success entrepreneur example	-0.0710	0.422	0.0155	0.911
Talk about new business	0.0915	0.282	0.1760	0.140
Keep up technology	0.1179	0.140	-0.0439	0.701
Start up problem	0.1636	0.161	-0.3766**	0.011
Urban			-0.3537	0.334
Distance	-0.1299	0.498	0.5607	0.349
Rent	-0.1939	0.534	0.1560	0.538
Risk rationed	0.2592	0.464		
Quantity rationed	0.1242	0.611		
Risk aversion score	0.0074	0.172		
Prudence score	0.0039	0.373		
Constant	-2.8214***	0.003	-3.0958**	0.029

Note: *p<0.1; **p<0.05; ***p<0.01

Bivariate Probit (Selection Equation)

	Shaanxi Sell Land Use Rights		Kentucky Quit Tobacco Farm	
	Coefficient	**P>z**	**Coefficient**	**P>z**
age <35	0.4838	0.265	0.1762	0.622
age 35-54	0.1648	0.678	-0.0783	0.760
age 55-64	0.5630	0.166	0.1206	0.631
White			0.9540	0.168
Death	-0.1579	0.467	0.2949	0.128
Divorce	0.7404	0.149	0.1752	0.636
Low income	-0.2780	0.260	-0.2437	0.524
Medium income	-0.0857	0.686	-0.3096	0.260
High income	-0.2424	0.294	-0.3545	0.218
Land	0.0689	0.668	-0.1564	0.478
Buyout Check			0.0000	0.210
Payment option			0.3559	0.155
Business Climate	-0.3159***	0.007	-0.4800***	0.008
Education	0.0375	0.427	0.1470**	0.034
Computer	0.1636	0.638	-0.2050	0.505
Internet	0.0092	0.981	-0.3559	0.184
Urban			0.5402	0.119
Distance	-0.2796	0.106	0.4239	0.393
Rent	-0.5394*	0.070	-0.0026	0.992
Risk rationed	0.2355	0.470		
Quantity rationed	0.0941	0.642		
Risk aversion score	-0.0007	0.884		
Prudence score	-0.0001	0.975		
Tobacco acres			-0.0014	0.682
Tobacco sell			-0.0000***	0.000
Hay			0.3612	0.105
Beef			0.3990*	0.075
Horses			0.1058	0.678
Vegetable			0.4142	0.150
Grains			-0.0460	0.838
Corn	0.5074**	0.020		
Wheat	-0.2086	0.267		
Constant	-0.3836	0.504	-2.8702**	0.012
Log pseudolikelihood	-368.5063		-223.7582	
Observations	316		302	

Note: *p<0.1; **p<0.05; ***p<0.01

4.9 Conclusions

The purpose of this study is to compare the similarities of venture creation and the adoption of a new technology and investigate the factors influencing farmers' entrepreneurial adoption decision during the transition period of the local economy in Shaanxi and Kentucky. In general, decision-makers select technologies with the best-expected net benefits. Therefore, when a new technology is available decision-makers continuously evaluate whether or not to adopt; when the discounted expected benefits of adoption are greater than the cost, the technology will be adopted. Similarly, when the expected profit of new venture is greater than current activities, decision-makers will start new businesses.

Using the 2010 survey data of farmers in Shaanxi 2005-2006 and the survey data of tobacco farmers in Kentucky, the study shows that several factors have a significant impact on farmers' entrepreneurial intentions.

Social network factor is significantly associated with farmer's entrepreneurial decision in Shaanxi but not in Kentucky. Shaanxi farmers who know other entrepreneurs are more likely to start new business. Social relations play an important role in establishing a firm. The study suggests that knowing people who are entrepreneurs affects entrepreneurial intentions. In addition, "learning by doing" or prior experience with other entrepreneurs have a strong impact on entrepreneurial decision in both Shaanxi and Kentucky. The relationship between entrepreneurs provides the resources that are crucial in starting and sustaining a new business. Even though, entrepreneurs have ability to run their business successfully, they also need complementary resources to produce and deliver their goods and service (Teece 1987). Thus, they need support, knowledge and access to distribution channels through social network. Moreover, the link and the interaction among entrepreneurs and their social network can enlarge

the availability of resources that help maintain a new firm (Hansen 1995).

The adoption decision depends on the age of farmer. Younger farmers both in Kentucky and Shaanxi are more likely to adopt venture. This is consistent with previous studies indicating that increasing age reduces the probability of adoption. The exogenous shock such as death of a household member is also significantly associated with decision to become entrepreneurs.

Some adoption factors are statistically significant in one region but not significant in another region. The analysis illustrates that ethnicity, payment option, and start up problem strongly influence a decision to start a new business in Kentucky but not in Shaanxi. The analysis in Kentucky supports the hypothesis that farmers with low income are "pushed" into entrepreneurial activities. In contrast, a human capital factor and business environment are strongly associated with Shaanxi farmer's entrepreneurial decision. Research findings suggest that the policy maker should support entrepreneurial social network. The human capital development is very important to encourage entrepreneurial activities and opportunities especially in developing countries.

4.10 *Appendix*

Figure 4.1: A Typical Diffusion Curve

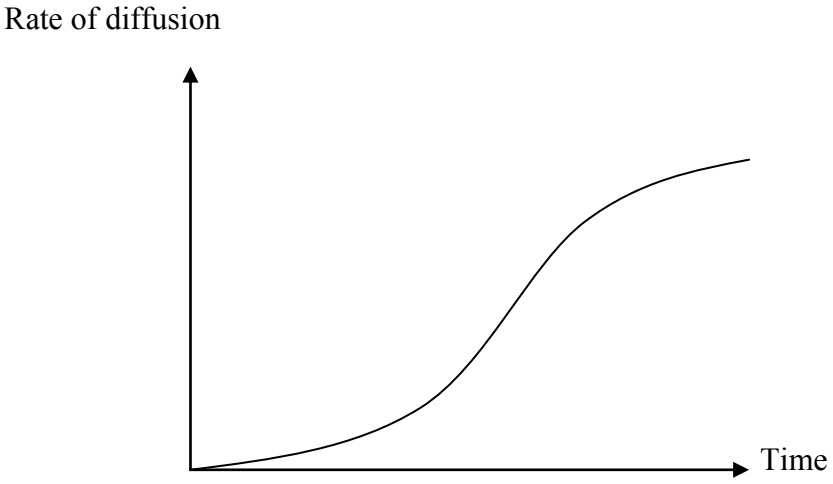

Table 4.8: List of the dependent and independent variables

Shaanxi

Variables	Survey questions	Coding
Dependent Variable Technology adoption (start business)	Are you planning to start a new business?	1, if yes, 0 o/w
Independent Variable Demographic		
Age <35	What is your age?	1, if <35, 0 o/w
Age 35-54		1, if 35-54, 0 o/w
Age 55-64		1, if 55-64, 0 o/w
Age >64		1, if >64, 0 o/w
Death	Have you experience death in your household within last three years?	1, if yes, 0 o/w
Divorce	Have you experienced divorced within last three years?	1, if yes, 0 o/w
Independent Variable Economic factor		
Income	What was the total household income in the past year from all sources including farming, part time labor and remittances (best guess)?	
Land size (own + rent)	How many mu do you own? How many mu do you rent?	
Land size Less than 6 mus		1, if yes, 0 o/w
Business climate	In general, how would you describe the current business climate for farmers in your area compared to last year?	1, if getting better 0, if about the same -1, if getting worse

Independent Variable **Human capital**		
Education	What is your level of education?	0, if never went to school, 1, if some elementary school, 2, if completed elementary school, 3, if some middle school, 4, if completed middle school, 5, if some high school, 6, if completed high school, 7, if some university or college, 8, if completed college or university
Computer	Do you have a computer at home?	1, if yes, 0 o/w
Internet access	Do you have internet access from you home?	1, if yes, 0 o/w
Independent Variable **Social network and Learning**		
Knowing people who started their own business	Do you personally know people who started their own business in your community or elsewhere?	1, if yes, 0 o/w
Social group participation	Do you belong to any social groups in your community (e.g., religious, service, clubs, etc.)?	1, if yes, 0 o/w
Loner	I consider myself a loner.	1, if completely untrue, 2, if untrue, 3, if neutral, 4, if true, 5 if completely true
Good support	Other community groups provide good support for people starting new businesses.	1, if strongly disagree, 2, if disagree, 3, if neutral, 4, if agree, 5, if strongly agree
Past experience	My past experience will be very valuable in starting a business.	1, if strongly disagree, 2, if disagree, 3, if neutral, 4, if agree, 5, if strongly agree
Success entrepreneur example	There are many examples of well-respected people who made a success of themselves starting new businesses.	1, if strongly disagree, 2, if disagree, 3, if neutral, 4, if agree, 5, if strongly agree
Talk about new business	People in my community often talk about new business opportunities.	1, if strongly disagree, 2, if disagree, 3, if neutral, 4, if agree, 5, if strongly agree
Keep up technology	How certain you are that your new business will be able to accomplish each of the following: Keep up with technological advances.	1, if highly uncertain, 2, if uncertain, 3, if neutral, 4, if certain, 5, if highly certain
Start up problem	Each possible start-up problem your new business might face 1) Being taken seriously as a business person 2) Balancing time between business and personal or family time 3) Lack of mentors or a support structure who can provide advice and support	1, if completely untrue, 2, if untrue, 3, if neutral, 4, if true, 5 if completely true
Independent Variable **Distance and geography**		
Distance	From what village are you reporting?	1, if village is far from Xi'an, 0 o/w
Independent Variable **Tenure**		
Own vs rent	How many mu do you own? How many mu do you rent?	1, if rent (mu) is greater than own (mu), 0 o/w
Independent Variable **Credit constraint**		
Risk rationed		1, if risk rationed farmer, 0 o/w
Quantity rationed		1, if quantity rationed farmer, 0 o/w

Independent Variable **Attitude toward risk**		
Risk aversion score	Risk aversion score is calculated based on farmers' willingness to take risk, risk management options use and perceptions.	
Prudence score	Prudence score is calculated based on the purposes of their precautionary savings	

Selection model

Variables	Survey questions	Coding
Dependent Variable Sell land use rights	If the Government made it legal for farmers to buy or sell land use rights, I would buy or sell land use rights?	1, if sell land use rights, 0 if buy land use rights
Independent Variable		
The independent variables in a selection model include independent variables in the main model except social network and learning factors, plus the following variables;		
Corn	Please list the top five crops you have grown in the past 12 months and sales in order of revenue	1, if corn, 0 o/w
Wheat	Please list the top five crops you have grown in the past 12 months and sales in order of revenue	1, if wheat, 0 o/w

Kentucky

Variables	Survey questions	Coding
Dependent Variable Technology adoption (start business)	Are you planning to start a new business?	1, if yes, 0 o/w
Independent Variable **Demographic**		
Age <35	What is your age?	1, if <35, 0 o/w
Age 35-54		1, if 35-54, 0 o/w
Age 55-64		1, if 55-64, 0 o/w
Age >64		1, if >64, 0 o/w
Ethnicity	What is your ethnicity?	1, if white, 0 o/w
Death	Have you experience death in your household within last three years?	1, if yes, 0 o/w
Divorce	Have you experienced divorced within last three years?	1, if yes, 0 o/w
Independent Variable **Economic factor**		
Income	What is your household income?	
Income 1 Less than $29,999		1, if yes, 0 o/w
Income 2 $30,000-$79,999		1, if yes, 0 o/w
Income 3 $80,000-$119,999		1, if yes, 0 o/w
Income 4 More than $120,000		1, if yes, 0 o/w
Land size (own + rent)	How many acres do you own? How many acres do you rent?	
Land size Less than 499 acres		1, if yes, 0 o/w
Buyout check	What is the total $ amount you expect to receive in tobacco buyout check?	

Payment options	There were several payment options available for those who were to receive tobacco buyout checks. Which option did you choose?	1, if a single lump sum payment, 0 o/w
Business climate	In general, how would you describe the current business climate for farmers in your area compared to last year?	1, if getting better 0, if about the same -1, if getting worse
Independent Variable **Human capital**		
Education	What is your level of education?	1, if no formal education, 2, if completed grade school, 3, if some high school, 4, if completed high school, 5, if some college/technical, 6, if completed 4 year college, 7, if some graduate work, 8, if graduate degree.
Computer	Do you have a computer at home?	1, if yes, 0 o/w
Internet access	Do you have internet access from you home?	1, if yes, 0 o/w
Independent Variable **Social network and Learning**		
Knowing people who started their own business	Do you personally know people who started their own business in your community or elsewhere>	1, if yes, 0 o/w
Social group participation	Do you belong to any social groups in your community (e.g., religious, service, clubs, etc.)?	1, if yes, 0 o/w
Loner	I consider myself a loner.	1, if completely untrue, 2, if untrue, 3, if neutral, 4, if true, 5 if completely true
Good support	Other community groups provide good support for people starting new businesses.	1, if strongly disagree, 2, if disagree, 3, if neutral, 4, if agree, 5, if strongly agree
Past experience	My past experience will be very valuable in starting a business.	1, if strongly disagree, 2, if disagree, 3, if neutral, 4, if agree, 5, if strongly agree
Success entrepreneur example	There are many examples of well-respected people who made a success of themselves starting new businesses.	1, if strongly disagree, 2, if disagree, 3, if neutral, 4, if agree, 5, if strongly agree
Talk about new business	People in my community often talk about new business opportunities.	1, if strongly disagree, 2, if disagree, 3, if neutral, 4, if agree, 5, if strongly agree
Keep up technology	How certain you are that your new business will be able to accomplish each of the following: Keep up with technological advances.	1, if highly uncertain, 2, if uncertain, 3, if neutral, 4, if certain, 5, if highly certain
Start up problem	Each possible start-up problem your new business might face 1) Being taken seriously as a business person 2) Balancing time between business and personal or family time 3) Lack of mentors or a support structure who can provide advice and support	1, if completely untrue, 2, if untrue, 3, if neutral, 4, if true, 5 if completely true
Independent Variable **Distance and geography**		
rural or urban community	Would you describe the community you live in as rural, urban or suburban?	1, if urban, 0 o/w

distance from university or college	How far is the closest school from you home?	1, if less than 50 miles, 0 o/w
Independent Variable **Tenure**		
Own vs rent	How many acres do you own? How many acres do you rent?	1, if rent (acres) is greater than own (acres), 0 o/w

Selection model

Variables	**Survey questions**	**Coding**
Dependent Variable Quit tobacco	Have you raised tobacco during last three years? Do you plan to grow tobacco in the future?	1, if had grown tobacco in the past three years, but does not plan to grow tobacco in the future, 0 o/w
Independent Variable		
The independent variables in a selection model include independent variables in the main model except social network and learning factors, plus the following variables;		
Tobacco acres	How many acres of tobacco did you raise last year?	
Tobacco sell	How many pounds of tobacco did you sell last year?	
Hay	Which of the farm activities listed below are you involved in?	1, if hay, 0 o/w
Beef	Which of the farm activities listed below are you involved in?	1, if beef, 0 o/w
Horses	Which of the farm activities listed below are you involved in?	1, if horses, 0 o/w
Vegetables	Which of the farm activities listed below are you involved in?	1, if vegetables, 0 o/w
Grains	Which of the farm activities listed below are you involved in?	1, if grains, 0 o/w

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CHAPTER 5

CONCLUSION

China is an example of successful policy of gradual and partial economic reform. In agricultural sector, the government has directed redistribution in land reform and the transformation away from private farming to collectivization. A financial system reform has provided an important boost to the desired transformation of China's economic growth. In addition, urbanization in China has encouraged venture creation, increased nonfarm labor to the cities and provided sustainable investment which became key factors in strengthening the country's growth. However, how far the rural reforms have succeeded is still ambiguous. After the reform began, the agricultural production rised immediately, but by the second half of the 1980s, the production dropped as more profitable job opportunities attracted rural labor away from agriculture. Despite the growth of township and village enterprises, regional inequalities became one of major problems. The performance of the Chinese financial system is still questionable due to unclear regulatory environment, lack of market freedom, and business restrictions. What will become evident is that policy agendas have become increasingly complex and interrelated. Hence, this dissertation aims to provide an assessment of the structural changes and its effect on other markets in the economy. We focus on the hypothetical policy allowing farmers to transact LURs and its impact on risk rationing in a rural credit market and entrepreneurial decision.

This dissertation makes key contribution in 1) exploring the economics of transaction in LURs, 2) providing a specific test of Boucher et al. (2008) framework on risk rationing, and 3) identifying the determinants of entrepreneurial adoption decisions caused by structural changes. The study in chapter 2 is the first to examine how Chinese farmers might respond if the Chinese

government made it legal for farmers to buy or sell LURs. The market of LURs, the demand and supply of LURs, the estimated equilibrium price, and the price elasticity have been explored. In addition, the study in Chapter 3 is believed to be among the first empirical validation of the risk rationing theory. We find the existence of risk rationing in the rural credit market in China. The results confirm that risk aversion and prudence are significantly correlated with risk rationing, therefore; efforts to enhance credit access must also deal with risk. Chapter 4 presents the similarities of venture creation and the adoption of a new technology and investigates the factors influencing farmers' entrepreneurial adoption decision during the transition period of the local economy in Shaanxi and Kentucky.

The empirical investigations in Chapter 2-4 have been done using the household data from Shaanxi province in China. The survey conducted in Kentucky, US has also been analyzed to compare with Shaanxi farmers in term of the entrepreneurial attitude and factors associated with venture creation. The rural areas in China and US, as a developing country and a developed country respectively, are totally different in term of economic and social system. It is interesting to examine the similarities and dissimilarities in entrepreneurial intention between two different countries where their entrepreneurial policy, support and education are different.

The significant findings of these chapters are summarized as follows. The objectives of these chapters are reiterated.

5.1 Chapter 2: On the Transaction Values of Land Use Rights in Rural China under Rural Policy Reform

Objective 1: examine how Chinese farmers might respond if the Chinese government made it legal for farmers to buy or sell LURs. The Chinese government has considered the possibility of liberalizing farmers' ability to transact LURs including selling and mortgaging the rights, to

boost rural development.

In 2008, The Chinese government has considered the policy and possibility of LURs transfer and transactability as farmers are allowed to buy and sell LURs for the first time. This could draw hundreds of millions of farmers more firmly into the market economy. We find a significant portion of the population participating in the market which numbers over 131 million farmers representing 800 million farmers employed in an agricultural sector in China.

Objective 2: examine the economics of transaction in LURs, estimate the value at which LURs could transact in equilibrium. Land use rights requires a complex understanding of market transparency, credit markets, farm size-productivity relationships, agency conflicts, market risks, covariate risks, contingent markets, rent seeking, government intrusion and market distortions (Binswanger et al. 1993), many of which are absent in rural China. It is important to understand how, in the presence of these complexities, a market for transactions in land use rights will evolve in rural China, who would be buyers, who would be sellers and at what price.

According to the analysis, the demand curve is represented by the percentage of farmers who would definitely buy or might buy LURs. We find the estimated aggregate demand or willingness to buy LURs is $Y_d = 387248X^{-0.952}$. The supply curve is represented by percentage of farmers who would definitely sell or might sell LURs. The estimated aggregate supply or willingness to sell LURs is $Y_s = 0.0018X^{0.8623}$.

The equilibrium price of LUR is 39,156 RMB. At this price 16.43% of farmers would be willing to sell their LURs while 16.43% of farmers would be willing buyers. Approximately 67% of farmers would not transact even at this price.

Objective 3: analyze the price elasticity of LURs and factors that would affect changes of LURs value. We determine some baseline characteristics that define and differentiate buyers and sellers and WTP and WTB values. Factors of interest are demographic factors, farm attribute and production factors, profitability factors, debt, credit and liquidity factors, attitude toward risk factors, and other variables including business climate, migrant farm labor, entrepreneurship, computer and internet, politics, and urban factor.

The results show that the price elasticity of demand is -0.952 and the price elasticity of supply is 0.8623. The inelasticity of demand and supply would imply changes in LURs value have a relatively small effect on the changes in percentage of farmers willing to buy and sell LURs.

We use ordinary least squares (OLS) and Tobit regressions to investigate which factors affect buy and sell positions. The maximum WTB and minimum WTS data obtained from self-declare questions are applied in the OLS analysis. The results show that variables significantly associated with maximum WTB are tomato farm, risk rationed and quantity rationed farmers, computer, village committee, and urban factor; while the entrepreneurship has significant impact on minimum WTS. The maximum WTB and minimum WTS data obtained from a Multiple Bounded Discrete Choice questions are applied in the Tobit analysis. We find that crop type, saving, internet and computer, political factor, and business climate appear to have significant impact on maximum WTB. The minimum WTS for LURs depends on gender, percentage of income from farming, saving, and internet.

Objective 4: evaluate farmer's intention to buy and sell LURs and how much they are willing to pay and receive for LURs. Because no formal market exists to transact land use rights, this paper

is the first to provide a preliminary assessment of farmers' willingness to buy and willingness to sell LURs. We employ a self-declare questions approach and a Multiple Bounded Discrete Choice (MBDC) approach, and use contingent valuation (CV) techniques to extract measures of willingness to sell (WTS) and willingness to buy (WTB) land use rights.

We examine how participants respond to each LURs value in order to reveal their willingness to buy (WTB) and willingness to sell (WTS) and provide the percentages of respondents that would buy or sell at the stated price. The distribution of responses follow expected patterns. The proportion of "Definitely Buy" and "Might Buy" responses generally increase but the proportion of "Definitely Sell" and "Might Sell" responses decline as threshold values decrease. The results show, as anticipated, that as the price falls farm households migrate from sellers to buyers.

We observe substantial differences in mean WTB and WTS. The self-declared WTB averages 24,571 RMB while the MBDC measure averages 58,443, almost twice as high. Likewise, the self-declared WTS is 71,748 RMB which is again almost half as much as the 110,857 RMB under the MBDC measure. The results suggest that in the near term there are not enough buyers (at a price of 24,000 RMB) to satisfy the price at which buyers would sell (at a price of 72,000 RMB). These results indicate that at the present there is a significant excess demand for LURs.

Objective 5: examine characteristics of potential buyers and sellers. Understanding the similarity and difference of these characteristics between LURs buyers and sellers will help the government formulate a better policy to directly support a target group.

The characteristics of potential buyers and sellers differ depending on the production,

formal credit access, urban, asset, income, geographical location, etc. The results show that tomato farmers are less likely to be sellers of land use rights because growing tomato can make high profit to them. Furthermore, farmers who can access a formal credit and who live near the city are less likely to be sellers of land use rights. On the contrary, the greater assets farmers hold would increase the probability of selling land use rights. The probability of buying and selling land use rights also varies between village regions.

Objective 6: explore potential policy implications. More detailed investigation of the factors affecting the implementation of legal and institutional change aiming to make property rights more secure could provide important insights for policy makers.

Proposed policy implications are as follows. First, the Chinese government should encourage farmers to buy LURs, increase farm invest and expand the production in order to enhance rural development through the LURs market which would benefit both the agricultural sector and farmer wealth. Second, it is important to enhance the certainty and security of LURs contract. Also, the consideration whether land contracts should be extended to 70 years from 30 years should be seriously addressed as it would give farmers more security and presumably increase the value of their LURs.

5.2: Chapter 3: Risk Rationing in China's Rural Credit Markets

Objective1: provide a specific test of Boucher et al. (2008) framework on risk rationing. We find risk rationing as a topic of inquiry to be critically important in understanding borrower behavior and credit decisions.

Objective 1.1: explore whether the insurance markets, asymmetric information, risk and collateral are essentially related to risk rationing in economic context. From definition, they assume these conditions are important for risk rationing to occur.

We find that the evidence is not consistent with BCG suggesting that risk rationing occurs when insurance markets are absent. We find risk averse households tend to have a higher willingness to pay for insurance and participate in insurance markets and are more likely to be risk rationed. In term of asymmetric information, a credit worthy and being a member of group guarantee appear to have no impact on risk rationing. However, credit worthy is significantly decreasing with quantity rationing as anticipated. We find relatively high risk averse and prudent farmers tend to be risk rationed.

Objective 1.2: test hypotheses that describe the most important factors explaining the existence of risk and quantity rationing, namely 1) Wealth-biased quantity rationing, 2) Risk rationing and financial wealth, 3) Risk rationing and productive wealth.

We find the incidence of risk rationing in rural China. There is a strong support to the theory that the financial poor is more likely to be quantity rationed. However, the result does not significantly support that the financial wealthy is more likely to be risk rationed. In addition, the productive wealth appears to have to no impact on all types of credit constraint status. Risk aversion and prudence are significantly correlated with risk rationing.

Objective 2: use the direct elicitation methodology (DEM) where a set of questions directly elicits the household's status as either credit constrained versus unconstrained.

We apply DEM to gather information on the credit market perceptions of both borrowers and non-borrowers. Constraint categories can be defined as follows. First, Price Rationed or Unconstrained farmer is the one who may be either non-borrower or borrower and was happy

with the amount he received. Second, Quantity Rationed or Supply-Side-Constrained farmer may be either an applicant who was rejected a loan or a non-applicant who knew that he would be rejected. Third, Risk Rationed or Demand-Side-Constrained farmer does not face a binding limit and therefore does not have excess demand for credit. The limiting constraint comes from the demand side. The demand is lower because of the risk-sharing rules associated with the loan contract. Among 730 respondents, the majority of farmers are price rationed which accounts for 79.9%. Approximately 14% and 6.2% of all respondents are quantity rationed and risk rationed farmers respectively.

Objective 3: estimate credit demand elasticities by credit constraint status. We want to explore the sensitivity to interest rate of risk rationed, quantity rationed, and price rationed farmers.

Elasticity of demand for credit is different among risk rationed, quantity rationed, and price rationed farmers. Quantity rationed individuals are less sensitive to high interest rate than others, but price rationed individuals are more sensitive to high interest rate and less sensitive to low interest rate. This illustrates the excess demand for credit of quantity rationed farmers as interest rate increases or decreases relative to price rationed farmers. We also find that a large proportion of risk rationed farmers has perfectly inelastic of demand for credit but in fact, when interest rate is low enough, risk rationed individuals are more likely to borrow. The results support that risk rationed farmers are more sensitive to low interest rate.

Objective 4: examine the attributes of risk rationed, quantity rationed, and price rationed farmers. Independent variables designed to capture the effects on credit rationing are demographic variables, Measures for wealth, Measuring for risk aversion and prudence, Measure of insurance market participation, asymmetric information, Elasticity of demand for credit, formal and informal credit, the willingness to borrow if they can use their land use rights as

collateral for a loan, and entrepreneurial activity.

The significant factors associated with risk rationed, quantity rationed, and price rationed farmers are as follows. First, there appears to be a strongly negative relationship between formal borrowing and risk rationing. The results suggest that there is a positive and significant relationship between informal borrowing and quantity rationed farmers. This does not appear to be the case for the price rationed farmers, which has a negative and significant coefficient for informal borrowing variable. The constraint to access in formal credit markets of quantity rationed farmers causes the increasing participation in informal credit markets relative to price rationed farmers.

Second, we find the coefficients of land use rights as collateral variable on risk rationing and price rationing are not different from zero. However, the variable is significant and negatively associated with quantity rationing. This could imply that quantity rationed farmers tend to borrow more when they can use land as collateral for a loan.

Third, we find female is more likely to be risk rationed but male is more likely to be price rationed. This is consistent with most studies indicating that women are found to be more averse to risk than men.

Finally, in the logit model, the coefficient of plan to start business variable is negative and significant on price rationed farmers. Farmers who plan to start business are not likely to be price rationed.

Objective 5: explore potential policy implications.

The interest rate subsidy and pricing strategies designed to increase credit access might be ineffective because of the inelasticity demand for credit of risk rationed individuals. In addition, a policy to increase land use rights and security would be successful if collateral played

a key role in borrowing agreements. However, if credit were constrained because of risk perception, then this policy would be unlikely to reduce credit constraint. Land use rights in China will be only partially effective as it does not increase farmers' willingness to offer up the collateral needed to obtain loans. As a result, policies that decrease the risk associated with loan contract to rural households would be more appropriate in the presence of risk rationing. Efforts to enhance the working of rural credit markets and credit access in order to increase agricultural investment and alleviate poverty must also deal with risk**.**

5.3 Chapter 4: Livelihood Disruption and Venture Creation: Entrepreneurship as Technology Adoption, A Comparison between Shaanxi Farmers and Kentucky Farmers

Objective 1: propose the conceptual model of entrepreneurship based on the technology adoption literature. We compare the similarities of the adoption of a new technology and the venture creation. Specifically, when a new technology is available, decision-makers continuously evaluate whether or not to adopt. The technology will be adopted when the discounted expected benefits of adoption are greater than the cost. Similarly, when the expected profit of new venture is greater than current activities, decision-makers will start new businesses.

The economics of technology adoption is a well developed literature with many accepted and testable models. Most prominent are the theories of learning by using and learning by doing. Learning by doing in technology adoption is comparable to prior experience with other entrepreneurs, whereas; learning by using is the information obtained from other entrepreneurs.

A bivariate probit model was used in both Shaanxi and Kentucky cases. The Kentucky farmer has to decide whether or not to continue growing tobacco and then decides whether or not to engage in entrepreneurial effort. The Shaanxi farmer has to decide whether or not to buy or

sell land use rights and then decides whether or not to engage in entrepreneurial effort.

Objective 2: examine and compare entrepreneurial characteristics and attitude of Shaanxi and Kentucky farmers to better understand their entrepreneurial uniqueness, opinion and business environment among two regions.

In the survey, respondents specified their level of agreement or disagreement on a five-level Likert scale for a series of statements related to 1) the level of support provided for new businesses in two communities, 2) the possible start-up problems, 3) the certainty of their new business accomplishment, 4) farmers' attitudes about their entrepreneurial abilities and business situation among two regions, 5) business activity in community, and 6) the entrepreneurial characteristics of Shaanxi and Kentucky farmers.

Objective 3: examine factors influencing entrepreneurial adoption decision and estimate the effect of internal family events on the decision to start a new business. We draw an analogy between factors affecting technology and entrepreneurial adoption and investigate whether Shaanxi and Kentucky farmers are influenced by different factors when making decisions to enter entrepreneurship. Key determinants of entrepreneurial intention are demographic factors, economic factors, farm structure, human capital, social network and learning, distance and geography, tenure, credit constraint, and attitude toward risk.

We find that social network factor is significantly associated with farmer's entrepreneurial decision in Shaanxi but not in Kentucky. In addition, "learning by doing" or prior experience with other entrepreneurs have a strong impact on entrepreneurial decision in both Shaanxi and Kentucky.

The adoption decision depends on the age of farmer. Younger farmers both in Kentucky and Shaanxi are more likely to adopt venture. The exogenous shock such as death of a household

member is also significantly associated with decision to become entrepreneurs.

The analysis illustrates that ethnicity, payment option, and start up problem strongly influence a decision to start a new business in Kentucky but not in Shaanxi. The analysis in Kentucky supports the hypothesis that farmers with low income are "pushed" into entrepreneurial activities. In contrast, a human capital factor and business environment are strongly associated with Shaanxi farmer's entrepreneurial decision.

Objective 4: explore potential policy implication.

Research findings suggest that the policy maker should support entrepreneurial social network. Social relations play an important role in establishing a firm. The results show that knowing people who are entrepreneurs strongly affects entrepreneurial intentions. In addition, "learning by doing" or prior experience with other entrepreneurs have a strong impact on entrepreneurial decision in both Shaanxi and Kentucky. Entrepreneurial firms have become an important driving force in the development of the Chinese economy. We find a human capital and business environment are strongly associated with Shaanxi farmer's entrepreneurial decision. Even though, China has placed more emphasis on the importance of entrepreneurship education in recent years, the participation is still low. Therefore, the government should develop effective entrepreneurship education and training, and boost the motivation for a consciousness of entrepreneurship. There is also a large gap between China and countries with a higher level of entrepreneurial activities in research and development transfer. Hence, it is important to encourage research and development at the level of firms, to increase productivity, to reinforce the protection of intellectual property rights, and to support the establishment of a combined research centre and increase connection among household and firms.

5.4 Final thoughts

The land reform in China characterized by the household contract responsibility system has driven the development of agricultural production and the rural economy, increased the income of farmers, and pushed the transfer of rural surplus labor forces and the rapid expansion of township-and-village enterprises. The efforts to increase the security of LURs and the policy allowing LURs to be transactable would also affect LURs values. Since farmland is the major factor of production and asset of farmers, factors affecting LURs values have significant implications for the opportunity cost of agricultural production. Changes in LURs values imply changes in farmer wealth which may affect the well-being of farm households.

It is clear that in order to increase the household income and reduce income instability caused by agricultural risks such as price and yield risks, it is crucial to promote the rural enterprises. A number of measures have been carried out to ensure a favorable institutional environment for rural enterprises. However, financial reforms in China have failed to create an effective system in which farmers can borrow from a formal credit market. Major problems in China's rural finances are asymmetric information, a lack of collateral, the unique structure of costs and risks, and the nonproductive use of loans. Therefore, informal credit is the dominant financing source for new ventures in China. Key improvements for an entrepreneurial environment should be to create a better financing environment and establish a credit system. More attention should be paid to improving bank loans by providing incentives for banks to grant loans to entrepreneurial firms.

In 2010, the Chinese government has considered launching trial programs that would allow farmers in some areas to use rights to farmland and residential land as collateral for loans. Secure property rights which can be pledged as collateral for loans would facilitate farmers'

application for loans from financial institutions which helps increase entrepreneurial activities and economic growth. Nevertheless, the empirical results verify the existence of risk rationing in China rural credit markets indicating that some farmers voluntarily withdraw from the credit market even they have the collateral wealth needed to qualify for a loan contract. Evidence of risk rationing in rural credit markets would suggest that the effectiveness of land titling policy encouraging farmers to pledge their rights as collateral security may be overestimated. Efforts to enhance agricultural investment and the working of agricultural credit markets must step beyond land titling and also deal with risk. Nonetheless, results show that elasticities were highly heterogenous across borrowers. Even though, the demand elasticity for credit is more inelastic for risk rationed farmers than quantity or price rationed farmers. When interest rates are low enough, some risk rationed farmers have high elastic demand and despite being non borrowers, could actually enter the credit market. Consequently, rural credit finances with favorable interest rate policy would partially increase credit market participation of risk rationed farmers.

All in all, the security of land program supporting producers' ability to use their land as collateral, the transaction of LURs, the risk rationing in rural credit markets and the entrepreneurial intention are interrelated. A better understanding of these related issues would have important implications for resource use, agricultural investment, the distribution of household welfare, rural credit markets, and off-farm labor markets which can further affect land productivity, output and economic growth.

Reference

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APPENDIX A

PARTICIPANT SURVEYS IN ENGLISH

Cornell University/Northwest Agriculture and Forestry University

Survey of Villagers to Assess

Credit Demand, Risk, Crop Insurance, Land Use Rights and Entrepreneurship

NARRATIVE TO BE READ TO RESPONDENTS: First of all I would like to thank you for taking the time to meet with us. This survey should take approximately 45 to 60 minutes and again I thank you for your time. The survey we are conducting is a joint product between Cornell University in the United States and Northwest Agriculture and Forestry University. We are interested in collecting information about the problems that you face in borrowing from your local lender and how you cope with risk and credit. We will also ask some questions about Crop Insurance, Land Use Rights and Entrepreneurship. Your responses will be completely confidential and under no circumstances will your responses be identifiable. In addition we understand that you may not have all of the precise information available. In these cases all we ask is that you provide us with your best estimates or best judgments. Finally, you have the right to refuse to answer any question we might ask.

Given these objectives are you willing to participate in this survey? Yes No

If NO then "*Ok, that is fine. For our records can you tell us why you do not want to participate?*

NOTE to interviewer: If answer above is because respondent does not feel they have the information we need then ask why and explain again that we only require a best effort on their part, and that we expect that not all respondents will have precise information. And then ask if they will reconsider.

NOTE to interviewer: If answer above is related to privacy issues, then remind respondent that their participation will be most helpful to our research and that they will remain anonymous and that their privacy is guaranteed. And then ask if they will reconsider.

IF YES…." *Thank you very much for your consent. Let us begin. We would like to start off by asking some general questions about your farm household*"……. Go to question 1.

A: Farm Characteristics and Farmer Risk Attitude

1. Sex of Respondent. _____Male; _____Female.

2. Age of Respondent. _____

3. From what village are you reporting? _____

4. a) Including yourself how many people live in this house _____ (*INTERVIEWER: this is the total number of people sharing the house of the respondent including children, parents etc.)*

   b) Are you a head of the household?
   YES_____, NO_____

5. What is your highest education level:
   a) Never Went to School_____
   b) Some elementary school _____
   c) Completed Elementary School_____
   d) Some middle school_____
   e) Completed middle school_____
   f) Some high school_____
   g) Completed High School _____
   h) Some University or college_____
   i) Completed College or University_____

6. Do you belong to any social groups in your community (e.g., cooperative, religious, volunteer group, clubs, etc.)? YES_____, NO_____

7. How many cell/mobile phones are there in your household? _____

8. How many years have you been farming? _____

9. What is the total size (1 acre = 6.07 Mu) of your household farm excluding rented? _____

10. How many additional Mu do you rent for agricultural production? _____

11. If you rent land how much do you pay on average per Mu per Year? _____

12. In general, how would you describe the current business climate for farmers in your area compared to last year?
    a) ____GETTING BETTER
    b) ____ABOUT THE SAME
    c) ____GETTING WORSE

13. Please list the top five crops you have grown in the past 12 months and sales in order of revenue from the most valuable to the least valuable

Rank	Crop	Total Sales (RMB)
1		
2		
3		
4		
5		

14. Is your farm your major source of income? YES_____, NO_____

15. What was the total household income in the past year from all sources including farming, part time labor and remittances (best guess)? _____ RMB

16. Please approximate the percent of your income in Q15 that comes from your entire farming operation only _____ (INTERVIEWER: Prod for this number. If they do not know exactly then say "we do not need an exact number just an approximate number" or "was it less or more than 50%, less than 25% etc. until a number is obtained.)

INTERVIEWER "Thank you that is very helpful. Now I would like to ask you some questions about your attitudes towards risk and the risks that you face on your farm"

B. Sources of Risk and Risk Perceptions

17. Please indicate if you are willing or not willing to take risks (Circle the most appropriate response).

Statement	Not Willing to Take Risk		Neutral to Take risk		Willing to Take Risk
I am willing to accept greater production risks to increase the chance of higher profits	1	2	3	4	5
I am willing to take risks with new technologies before I see good results in other farms	1	2	3	4	5
I am willing to take risks with new management practices before I see good results in other farms	1	2	3	4	5

For Q18 – Q20, if no growing corn or wheat, skip Q18 - Q20

18. If you grow corn or wheat, identify the lowest price you believe possible, the price that you believe is most likely to be received, and the highest possible price you believe possible (RMB/jin) where (1jin = 500g) in ***the next crop year (2010/11)*** *(INTERVIEWER: for each crop production the respondent for lowest, most likely and highest: you may say things like 'we do not need the exact numbers, just your own personal judgment about what the prices might be' by most likely price ask them what price they expect to receive in the next harvest. Note: most likely can be the same as lowest and highest)*

Crop	Lowest possible price (RMB/jin)	Most likely price (RMB/jin)	Highest possible price (RMB/jin)
1 Corn			
2 Wheat			

19. If you grow corn or wheat, identify the lowest yield you believe possible, the yield that you believe is most likely to be received, and the highest possible yield you believe possible (jin/mu) in ***the next crop year (2010/11)*** If you do not recall exacts, please answer to nearest within 10 jin/mu
(INTERVIEWER: for each crop production the respondent for lowest, most likely and highest: you may say things like 'we do not need the exact numbers, just your own personal judgment about what the yields might be' by most likely yield ask them what yield they expect to receive in the next harvest. Note: most likely can be the same as lowest and highest)

Crop	Lowest possible yield (jin/mu)	Most likely yield (jin/mu)	Highest possible yield (jin/mu)
1 Corn			
2 Wheat			

20. If you grow corn and wheat, what is the lowest and highest yield (jin/mu) that you recall from your years in farming? If you do not recall exacts, please answer to nearest within 10 jin/mu (*INTERVIEWER: if cannot recall exact year, ask how ago many years and decode year it occurred = 2010 – number of years ago)*

Crop	Lowest historical yield (jin/mu)	Year it occurred	Highest historical yield (jin/mu)	Year it occurred	Average yield across year
1 Corn					
2 Wheat					

C. Risk Management Options Use and Perceptions

21. Please indicate how **important** you believe each item to be in terms of risk management in your farm. Then, mark a "0" if **you do not use** this to manage risk in **your** operation. Scale with 1 = not important, 2 = less important, 3 = neutral, 4 = important, and 5 = very important (Circle the most appropriate response).

Risk Management Options	**0 if not used**	**Not Important**				**Very Important**
More than one crop, animal, or farm diversification	0	1	2	3	4	5
Fields or farms in different locations (geographic diversification)	0	1	2	3	4	5
Irrigation	0	1	2	3	4	5
Spreading sales: selling each product over a period of time rather than all at once (diversified marketing)	0	1	2	3	4	5
Using contracts to market your crop in advance at a fixed price	0	1	2	3	4	5
Government programs	0	1	2	3	4	5
Maintaining financial reserves: having cash and readily convertible assets(e.g. machineries, livestock)	0	1	2	3	4	5
Investing off-farm for other sources of income	0	1	2	3	4	5

D. Crop Insurance Use and Perceptions

INTERVIEWER: Crop insurance is a common tool used by western farmers. Crop insurance will pay you if your crop yield falls below some percentage of your average yields. For example if your average yield is 500 jin/mu for a particular crop, insurance may provide a payment if actual crop yield falls below this average. For example if actual yield is 400 jin/mu then you would receive a payment based on the difference between 500 jin and 400 jin (=100 jin) times the average harvest price. If the price is 0.75RMB/jin then you would receive 0.75(500-400) = RMB75 but if yields are above 500 jin/mu you receive nothing from the insurer.*

22. Is the crop insurance currently available to you?
    Yes_____ No_____(if no skip to *Q25*)

23. (*If answer to Q22 is Yes*) Do you purchase crop insurance?
    Yes_____ No_____(if no skip to *Q26*)

24. (*If answer to Q23 is Yes*) List crops covered. How much do you pay per mu?

Crop covered	Insurance premium (RMB/mu)
1	
2	
3	
4	
5	

25. (*If answer to Q22 is No*) If crop insurance were offered in China do you think that you would purchase crop insurance? Yes_____ No____

26. If you grow either corn and/or wheat which do you believe has a higher chance of a significant yield loss next year Corn_____ Wheat _____*? (Only one can be selected. If only one of corn or wheat is grown enter that crop)*

27. Imagine a crop insurance product that would guarantee that your revenue per mu on (***for crop indicated in Q26***) never falls below 300 RMB/mu. Taking into account all past crop yields, and what you believe about next year's crop yield,

    a) Would you be willing to pay 18 RMB/mu to guarantee a minimum of 300 RMB/mu.?
    Definitely Buy___ Might Buy ___ Would Unlikely Buy ____ Definitely would not buy_____

    b) Would you be willing to pay 9.0 RMB/mu to guarantee a minimum of 300 RMB/mu?
    Definitely Buy___ Might Buy ___ Would Unlikely Buy ____ Definitely would not buy_____

    c) Would you be willing to pay 3.5 RMB/mu to guarantee a minimum of 300 RMB/mu?
    Definitely Buy___ Might Buy ___ Would Unlikely Buy ____ Definitely would not buy_____

    d) Would you be willing to pay 1.0 RMB/mu to guarantee a minimum of 300 RMB/mu?
    Definitely Buy___ Might Buy ___ Would Unlikely Buy ____ Definitely would not buy_____

28. Considering all aspects of the household including the farm, operations, house, contents, automobiles, machinery and equipment do you regularly purchase insurance for any of the following items (***Leave blank if not applicable***):

a.	Life Insurance	Yes_____	No____
b.	Fire insurance for home and contents	Yes_____	No____
c.	Automobile Insurance	Yes_____	No____
d.	Health/Medical Insurance	Yes_____	No____
e.	Farmer's minimum living standard security	Yes_____	No____
f.	Rural old-age insurance	Yes_____	No____
g.	Protection against crop loss (crop insurance)	Yes_____	No____
h.	Protection against livestock loss (livestock insurance)	Yes_____	No____
i.	Other _____		

29. Imagine a new loan product that had a built-in insurance mechanism so that when a severe drought occurs the amount of debt you have to repay decreases as the intensity of the drought increases. Would you be interested in such a loan product even if it required an increased interest rate?
    a. Not at all interested
    b. Moderately interested
    c. Very Interested

E. Farm Finance and Risk Management

30. Do you have any debt outstanding? YES ____ NO _____

    a. IF YES please indicate the total amount of money you owe _____RMB
    b. Interest Rates Based on Per Year _____

	Loan Amount	Annual Interest Rate
a.Friends,		
b.Relatives		
c.Formal Lenders (RCC, ABC, Postal Savings, etc.)		
d.Money Lenders/ Pawn Shop		
e.Other		

31. If you sell all your assets (home, land, livestocks, agriculture produce, etc.) how much will you get (in RMB) _____.

32. Regarding to your current total amount of debts, assets and productivity, what do you think about your debt level?
    1 = very low, 2 = low, 3 = adequate, 4 = high, 5 = very high

33. In your village which of these two statements is most correct
    a. Local RCC or Bank evaluates my creditworthiness and offers me a loan without me requesting a loan TRUE_____ FALSE_____
    b. I must formally request a loan from my local RCC or Bank TRUE_____FALSE_____
    (Surveyor: *Q33* a and b are mutually exclusive: If one is False the other is True)
    IF *Q33b* is TRUE skip to *Q40*

34. (*if answer to Q33a is TRUE*) On the **most recent** loan OFFER approximately how much (RMB) in loan did RCC or Bank OFFER to lend you?_____ RMB

35. Of the amount offered in *Q34*, how much of loan (RMB) did you ACTUALLY use? (Do not leave blank. put 0 if no loan was used, If don't know put 9999)_____RMB

36. (*If answer to Q35 is greater than zero*) What are purposes of loan in *Q35* that you ACTUALLY used (answer more than one if necessary)?

    a. Agricultural production Yes_____ No____
    b. House construction/renovation Yes_____ No____
    c. Purchase of car/motorcycle/bicycle Yes_____ No____
    d. Household consumption Yes_____ No____
    e. Medical expenses Yes_____ No____
    f. Education expenses Yes_____ No____
    g. Other?_____

37. Is the amount of loan you used in *Q35* (INTERVIWER: remind a respondent of answer to *Q35*) less than, equal to or more than the amount that you ACTUALLY needed for the purpose stated in *Q36*?
    Less than _____ Equal to _____ More than _____

38. (*If answer to Q35 is less than Q34*) If the amount you actually borrowed was less than the amount that the lender was willing to provide you, what do you believe are the major reasons you ***did not use*** the total amount of credit made available to you (answer more than one if necessary)?

a.	I do not need loan/ I do not invest	Yes_____	No____
b.	I have own money and saving to invest	Yes_____	No____
c.	I borrowed from friends	Yes_____	No____
d.	Interest rate is too high	Yes_____	No____
e.	I am afraid of losing collateral	Yes_____	No____
f.	I am not credit worthy	Yes_____	No____
g.	I cannot get a guarantee	Yes_____	No____
h.	Loan products are not flexible enough to meet my ability to repay	Yes_____	No____
i.	Other	Yes_____	No____

39. Do you think you have sufficient collateral to secure a higher loan amount than you identified in *Q35*? Yes_____ No_____

THEN SKIP TO Q52

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40. (*If answer to Q33b is TRUE*) Have you applied for a loan from RCC or bank within the past 2 years? Yes____ No_____(If No skip to *Q49*)

41. (*If answer to Q40 is YES*) On the **most recent** loan request approximately how much (RMB) in loan did you request? _____RMB

42. How much (RMB) did RCC or banks offer to you? _____RMB (include zero if loan fully denied)

43. (*If answer to Q42 is greater than zero*) Did you accept the offered loan? Yes_____ No_____(If No skip to *Q46*)

44. (*If answer to Q43 is Yes*) What are purposes of offered loan that you used (answer more than one if necessary)?

a.	Agricultural production	Yes_____	No____
b.	House construction/renovation	Yes_____	No____
c.	Purchase of car/motorcycle/bicycle	Yes_____	No____
d.	Household consumption	Yes_____	No____
e.	Medical expenses	Yes_____	No____
f.	Education expenses	Yes_____	No____
g.	Other	Yes_____	No____

45. Is the amount of loan you received in *Q42* (INTERVIWER: remind a respondent of answer to *Q42*) less than, equal to or more than the amount that you ACTUALLY needed for the purpose stated in *Q44*?

Less than _____ Equal to _____ More than _____

46. (*If answer to Q43 is No*) Why didn't you accept the offered loan (answer more than one if necessary)?
    a. The amount of offered loan is too little for what I planned to invest Yes_____ No____
    b. I borrowed from friends instead Yes_____ No____
    c. Interest rate is too high Yes_____ No____
    d. I am afraid of losing collateral Yes_____ No____
    e. Loan products are not flexible enough to meet my ability to repay Yes_____ No____
    f. Other Yes_____ No____

47. Do you think you have sufficient collateral to secure a higher loan amount than you identified in *Q42*? Yes_____ No_____

48. (*If answer to Q42 is less than Q41*) what do you believe are the major reasons you were denied your partial or full credit request (answer more than one if necessary)?

Reasons	Very Likely	Moderately likely	Likely	Not likely	Not very likely
a.Insufficient collateral					
b.Crops/Livestock subject to too much price risk					
c.Subject to too much yield risk					
d.The crop grown are vulnerable to the extreme weather					
e.I have failed to repay the loan in the past					
f.Bank does not believe I am trustworthy					
g.My bank doesn't believe that I earned enough income					
h.The repayment schedule required by RCC does not match the timing of sales from my farm					
i.Could not find someone to guarantee loan					
j.Other					

Then skip to Q52

---

49. (*If answer to Q40 is No*) Why you have not applied for loan from RCC or bank in the last 2 years (answer more than one if necessary)?
    a. I do not need loan/ I do not invest Yes_____ No____
    b. I have own money and saving to invest Yes_____ No____
    c. I borrowed from friends Yes_____ No____
    d. Interest rate is too high Yes_____ No____
    e. I am afraid of losing collateral Yes_____ No____

f. I am not a credit worthy Yes_____ No____
g. I cannot get a guarantee Yes_____ No____
h. Loan products are not flexible enough to meet my ability to repay Yes_____ No____
i. Other Yes_____ No____

50. Do you believe you have sufficient collateral to obtain adequate farm credit?
Yes _____ No _____ Not sure _____
51. *(If answer to Q50 is No or Not sure)* assuming that you had sufficient collateral to secure any amount of loan that you need to borrow, would you borrow more?
Yes _____ No _____ Not sure _____

Then continue to Q52

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52. (*If answer to Q38(e) OR Q49(e) is Yes*) In the previous response, you indicated that you are afraid of losing collateral. Why you are afraid of losing collateral?

a. I cannot risk losing my business
Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

b. I cannot risk not sending my kids to school
Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

c. I cannot risk not having enough money to buy food
Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

d. I cannot risk not having enough money for medical expenses
Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

e. I cannot risk not having a place to live
Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

f. I cannot risk not having enough money when I am retired/old
Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

g. I cannot risk losing a chance for future credit
Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

h. I cannot risk losing my social reputation within the village
Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

i. I cannot risk not having enough savings to cover collateral losses
Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

j. I am old and I want to live securely
Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

k. I do not have skill outside off-farming
Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

53. (*If answer to Q38(g) OR Q49(g) is Yes*) If you could get guarantee, would you apply for loan? Yes ___ No ___

Everybody answers following questions

54. Are you currently considered a 'Credit Worthy' borrower by your local RCC? Yes ___ No ____

55. Does your current formal lender require a 'Group Guarantee' in order for you to get a loan? Yes ___ No ___

56. Are you a member of a Group Guarantee? Yes ___ No ___

57. (*If answer to Q56 is Yes*) Because I am a member of a Group Guarantee I can get a larger loan than I could get otherwise?

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

58. (*If answer to Q56 is Yes*) Because I am a member of a Group Guarantee I can get a lower interest rate than I could get otherwise?

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

59. (*If answer to Q56 is No*) I am not a member of a Group Guarantee because I ***do not need*** to borrow from RCC or Bank.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

60. (*If answer to Q56 is No*) I am not a member of a Group Guarantee because I ***do not want*** to borrow from RCC or Bank.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

61. (*If answer to Q56 is No*) I am not a member of a Group Guarantee because I am not considered to be Credit Worthy.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

62. (*If answer to Q56 is No*) I am not a member of a Group Guarantee because I do not want to guarantee someone else's debt.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

63. (*If answer to Q56 is No*) I am not a member of a Group Guarantee because the procedures are too bothersome

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

64. How much do you currently owe to RCC or Banks ? _____ RMB
If > 0 go to Q64 a) , if = 0 go to Q64 b)

64 a) Suppose that the current RCC rate of interest is 7% per year. Assume that you can borrow as much as you need at this interest rate so that all of you credit needs are satisfied, if interest rates changed from 7% to the following rate, you would

New Interest rate %	Definitely Borrow a lot more	Definitely Borrow some more	Maybe borrow a lot more	Maybe borrow some more	Definitely not borrow anymore
6					
5					
4					
3					

New Interest rate %	Definitely Borrow a lot less	Definitely Borrow some less	Maybe borrow a lot less	Maybe borrow some less	Definitely not borrow any less
8					
9					
10					
11					

64 b) You indicated that you have no debt to RCC or banks. Suppose you can have all your loan needs met at the following rate. What would your borrowing activity be given the following annual interest rate?

New Interest rate %	Definitely Borrow a lot	Definitely Borrow some	Maybe borrow a lot	Maybe borrow some	Definitely not borrow any
3					
4					
5					
6					
7					
8					
9					
10					
11					

65. If I ***could borrow more*** from my lender than I am currently borrowing at the ***same interest rate*** I would be more likely to borrow from my lender.

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree ____

66. I would be willing to ***pay more than the current interest rate*** in order to ***obtain loan larger than RCC or Bank currently provides***.

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree ____

67. If ***interest rates were lower than current interest rates*** I would be more likely to borrow from a lender.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

68. If ***the cost*** of obtaining a loan (fees, non-interest charges) on RCC or bank loans were lower than current costs I would be more likely to borrow from a bank or RCC.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

69. Have you ever been late in repaying a loan to the following lender? (INTERVIEWER: By 'being late' we mean that payment was not promptly paid as agreed upon by the lender, but payment was eventually made)

	Yes	No
a.Friends,		
b.Relatives		
c.Formal Lenders (RCC, ABC, Postal Savings, etc.)		
d.Money Lenders/ Pawn Shop		
e.Other		

70. Have you ever defaulted (that is not repaid) on a loan from the following lender? (INTERVIEWER: By defaulting we mean that loan was NEVER repaid as agreed upon by the lender)

	Yes	No
a.Friends,		
b.Relatives		
c.Formal Lenders (RCC, ABC, Postal Savings, etc.)		
d.Money Lenders/ Pawn Shop		
e.Other		

INTERVIEWER: *Now I would like to ask you some questions about the saving and borrowing environment.*

71. What proportion of Household income are you able to save in a year?

a) None b) Less than 5% c) Between 5 and 10% d) More than 10%

72. What are purposes of your saving (answer more than one if necessary)?

a. I save because I have nothing to spend money on

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

b. I save to buy, build or renovate a house

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

c. I save to repair a house

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

d. I save to purchase automobile (e.g. car, motorcycle, tractor)

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

e. I save in case my automobile (e.g. car, motorcycle, tractor) breaks down

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

f. I save for traveling/leisure expenses

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

g. I use my saving for future off-farm investment

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

h. I want to make sure that savings cover my loan

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

i. I save for unexpected medical emergency

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

j. I save to send kids to school/university

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

k. I save for child marriage

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

l. I save to take care of my parents

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

m. I save to protect job loss

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

n. I save for unanticipated crop loss

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

o. Other

Strongly Agree____ Moderately Agree_____ Agree_____ Disagree_____ Strongly Disagree _____

73. In your opinion, do you think saving is important?

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

74.

(a) I have any apprehension of obtaining a loan from a Bank or Rural Cooperative

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

(b) I have unpaid debts on previous RCC or bank loans.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

(c) Interest rates on RCC or bank loans are higher than interest rates on loans from friends or relatives.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

(d) Interest rates on RCC or bank loans are higher than I am able to pay.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

(e) I would ***prefer*** to borrow from a friend or relative.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

(f) I do not like to be indebted to a bank or RCC.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

Credit Rationing Impact

Please answer the following questions. Interviewer here we use the term 'borrowing constraint'. By borrowing constraint we mean that the farmer cannot obtain all of the funds requested from an RCC or bank in the amounts or time frame required.

75. If I faced a borrowing constraint I would use less input than is required for maximizing farm income.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

76. If I faced a borrowing constraint I would need wages from off-farm employment.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

77. If I faced a borrowing constraint I would not be able to provide a strong education and adequate health care for my children.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

78. If I faced a borrowing constraint my family members (including me) would not be able to get adequate food throughout the year.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

79. If I could get adequate credit as much credit as I needed from a bank or RCC, I would be more likely to (choose YES only one)

a)	leave agriculture and start a non-farm enterprise	Yes_____	No____
b)	leave agriculture and work as off-farm labor	Yes_____	No____
c)	Remain in agriculture and expand agricultural production	Yes_____	No____
d)	Remain in agriculture and also start a non farm business	Yes_____	No____
e)	None of the above	Yes_____	No____

80. I would prefer getting a loan at ***very low interest*** rate rather than ***borrow from relative.***

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

81. I would prefer getting a loan at the ***current market interest*** rate rather than ***borrow from a relative.***

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

82. I would prefer getting a loan at ***very low interest*** rate rather than ***borrow from a friend.***

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

83. I would prefer getting a loan at the ***current market interest*** rate rather than ***borrow from a friend.***

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

Land Use Rights

There are political discussions around the sale of farmland use rights. Suppose that the Government made it legal for farmers to buy or sell land use rights, answer the following questions.

84. On average how much profit per year does your farm earn from every mu of cropped land?_____ RMB

85. How many mu are in one land use rights?_____mu

86. If the Government made it legal for farmers to buy or sell land use rights, I would (choose YES only one)

    a) Sell land use rights and start a non-farm enterprise Yes_____ No_____
    b) Sell land use rights and work as off-farm labor Yes_____ No_____
    c) Buy land use rights and expand agricultural production Yes_____ No_____
    d) Buy land use rights and start a non farm business Yes_____ No_____
    e) Do nothing Yes_____ No_____

87. (*If answer to Q86 is a or b*) If you were to sell your land use rights today, what is the minimum amount you would be willing to receive for the land use rights? _____RMB

88. (*If answer to Q86 is a or b*)

    You are offered the opportunity to buy 3 lottery tickets (A, B and C) that give you, with the different pair of probabilities (50% : 50%), (70% : 30%) and (30% : 70%) either

    - if your lottery ticket is drawn, it would provide you free of cost and with all rights contained, an additional land user right with the rate you specified in *Q87*.
    - if your lottery ticket is not selected within, you receive nothing

    (*Instruction: Ask the respondent column by column to consider the following lottery. The probabilities (which can be explained as a chance of winning) for each of the two outcomes should be read to the respondent. For each lottery the respondent needs to be reminded of the price indicated in Q87 since that is the amount that will be won. After making sure the respondent understands what is to be won or lost you can simplify by saying something like how much would you be willing to pay for the lottery if there was a 50% chance of winning and a 50% chance of losing , or a 70% chance of winning and 30% chance of losing. BOTH probabilities must be read to the respondent. If it is easier you can show the following table to the respondent. The respondent may want to think about it for a few seconds. When all three lotteries are complete, show the table to the respondent and ask if he/she is satisfied with the bids; allow for revision)*

    What is the most you are prepared to pay for each lottery ticket? (If do not want then = 0)

	Lottery A probability	Lottery B probability	Lottery C probability
if your lottery ticket is drawn, you win an additional land use rights worth the price you specified in *Q87* which you can sell	50%	70%	30%
if your lottery ticket is not selected, you receive nothing	50%	30%	70%
What is the most you are prepared to pay for this lottery ticket (in RMB)? (If do not want then = 0)			

89. (*If answer to Q86 is a or b*) What do you plan to do with the land use rights money you receive? (Mark the number for all that apply.)

a) PAY OFF DEBTS

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

b) SPEND ON USUAL HOUSEHOLD EXPENSES

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

c) PAY MEDICAL EXPENSES

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

d) RETIREMENT FUND

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

e) INVEST IN FINANCIAL ASSETS (e.g., STOCKS, BONDS, CDs, MUTUAL FUNDS)

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

f) INVEST IN EXISTING ON FARM BUSINESS ACTIVITY

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

g) INVEST IN EXISTING OFF FARM BUSINESS ACTIVITY

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

h) INVEST IN NEW ON FARM BUSINESS ACTIVITY

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

i) INVEST IN NEW OFF FARM BUSINESS ACTIVITY

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

j) SPEND ON ONE-TIME HOUSEHOLD EXPENSES

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

k) GIFTS OR CHARITY

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

l) I HAVE NOT DECIDED HOW TO USE THIS MONEY

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

m) OTHER

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

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90. (*If answer to Q86 is c or d*) If you were to buy a land use rights today, what is the maximum amount you would be willing to pay for the land use rights?_____RMB

91. (*If answer to Q86 is c or d*)

You are offered the opportunity to buy 3 lottery tickets (A, B and C) that give you, with the different pair of probabilities (50% : 50%), (70% : 30%) and (30% : 70%) either

- if your lottery ticket is drawn, it would provide you free of cost and with all rights contained, an additional land user right with the rate you specified in *Q90*.
- if your lottery ticket is not selected within, you receive nothing

(*Instruction: Ask the respondent column by column to consider the following lottery. The probabilities (which can be explained as a chance of winning) for each of the two outcomes should be read to the respondent. For each lottery the respondent needs to be reminded of the price indicated in Q90 since that is the amount that will be won. After making sure the respondent understands what is to be won or lost you can simplify by saying something like how much would you be willing to pay for the lottery if there was a 50% chance of winning and a 50% chance of losing , or a 70% chance of winning and 30% chance of losing. BOTH probabilities must be read to the respondent. If it is easier you can show the following table to the respondent. The respondent may want to think about it for a few seconds. When all three lotteries are complete, show the table to the respondent and ask if he/she is satisfied with the bids; allow for revision)*

What is the most you are prepared to pay for each lottery ticket? (If do not want then = 0)

	Lottery A probability	Lottery B probability	Lottery C probability
if your lottery ticket is drawn, you win an additional land use rights worth the price you specified in *Q90* in which you can grow more crop	50%	70%	30%
if your lottery ticket is not selected, you receive nothing	50%	30%	70%
What is the most you are prepared to pay for this lottery ticket (in RMB)? (If do not want then = 0)			

92. *(everybody answers this question)* If you can use your land use rights as a collateral for a loan, you would

Definitely borrow more _____ Maybe borrow some more _____ Only borrow a little more_____
Not borrow any more _____

93. Suppose that you had the opportunity to either buy or sell your land use rights, would you buy or sell your land use rights at the following value of land use rights?

		If Buy	If Sell	You would				
Scenario	LUR	Borrow and must pay for 10 years	Receive sell amount and receive investment income of 10%/year	definitely Buy	Might buy	neither buy nor sell	might sell	definitely sell
1	300,000	44,709	30,000					
2	150,000	22,354	15,000					
3	100,000	14,903	10,000					
4	75,000	11,177	7,500					
5	60,000	8,942	6,000					
6	50,000	7,451	5,000					
7	42,857	6,387	4,286					
8	37,500	5,589	3,750					
9	33,333	4,968	3,333					
10	30,000	4,471	3,000					
11	27,273	4,064	2,727					
12	25,000	3,726	2,500					
13	23,077	3,439	2,308					
14	21,429	3,193	2,143					
15	20,000	2,981	2,000					

Entrepreneurship

Please tell us what you think about the possibility of starting a new business.

94. Have you ever started a new business? Yes ___ No ___

95. Other than yourself, do you personally know people who started their own business in your community or elsewhere? Yes ___ No ___

96. Have you ever considered starting a new business, either full-time or part-time
    a) ____YES, FULL-TIME
    b) ____YES, PART-TIME
    c) ____NO

97. Are you planning to start a new business? Yes ___ No ___

98. *(If answer to Q97 is Yes)*, what type of business do you plan to start?
    a) Retail _____
    b) Wholesale _____
    c) Food processing _____
    d) Manufacturing _____
    e) Franchise _____
    f) Service _____
    g) Catering and Accommodation _____
    h) Construction _____
    i) Other _____

99. If you could buy or sell your Land Use Rights, would this influence your decision on whether or not to start a new business? Yes ___ No ___

100. Do you have a computer at home? Yes ___ No ___

101. Do you have internet access from your home? Yes ___ No ___

102. Do you use the internet and e-mail for business activities? Yes ___ No ___

103. What is the employment status for you and your spouse, if applicable? (Mark number of one choice in each column.)

YOU	SPOUSE	
1____	1____	EMPLOYED FULL-TIME ON FARM
2____	2____	EMPLOYED FULL-TIME LOCALLY OFF FARM
3____	3____	MIGRANT WORKER FARM LABOR
4____	4____	MIGRANT WORKER OFF-FARM LABOR
5____	5____	EMPLOYED PART-TIME
6____	6____	EMPLOYED TEMPORARILY
7____	7____	UNEMPLOYED
8____	8____	HOME MAKER
9____	9____	MAKING CRAFT
10____	10____	RETIRED
11____	11____	IN SCHOOL

104. A) Please mark "X" if you or immediate family or close friend a village leader
Self_____ Family _____ Close friend _____

B) Please mark "X" if you or immediate family or close friend on the village committee
Self_____ Family _____ Close friend _____

C) Please mark "X" if you or immediate family or close friend work for the state government
Self_____ Family _____ Close friend _____

D) Please mark "X" if you or immediate family or close friend work for the county government
Self_____ Family _____ Close friend _____

E) Please mark "X" if you or immediate family or close friend work for state enterprise
Self_____ Family _____ Close friend _____

F) Please mark "X" if you or immediate family or close friend work for RCC/Bank
Self_____ Family _____ Close friend _____

105. We would like to learn about the level of support provided for new businesses in your community. Please indicate the extent to which you agree or disagree with each statement by marking your answer.

	Statements	**(Please mark "X" your answer.)**				
1	Those with successful businesses get a lot of attention and admiration…	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
2	Young people are encouraged to start their own businesses……	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
3	State and local governments provide good support for people starting new businesses……..	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
4	Bankers go out of their way to help new businesses get started……. …….	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
5	RCC go out of their way to help new businesses get started……. …….	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
6	Investors go out of their way to help new businesses get started……. …….	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
7	Other community groups provide good support for people starting new businesses…… ……	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
8	The local media does a good job of covering local business news ……	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
9	Most of the leaders in this community are people who own their own businesses…… ……	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
10	There are many examples of well-respected people who made a success of themselves starting new businesses…… ……	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

106. Once again, imagine that you have decided to start a new business. Please indicate how accurately you think the following statements would describe each possible start-up problem your new business might face by marking your answer.

Statements **(Please mark 'X" your answer.)**

1	Being taken seriously as a business person.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
2	Balancing time between business and personal or family time	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
3	Lack of mentors or a support structure who can provide advice and support.....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE

107. We would like to turn our attention to the news media and learn about sources of communication in your community. Please indicate how reliable you think each source of information is by marking your answer.

	Statements	**(Please mark 'X" your answer.)**				
1	Newspaper.....	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE
2	TV/Radio	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE
3	Internet.....	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE
4	Family member	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE
5	Friend.....	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE
6	Local government official ...	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE
7	Local university/college.....	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE
8	Village/Local lender.....	NOT RELIABLE	SLIGHTLY RELIABLE	RELIABLE	QUITE RELIABLE	VERY RELIABLE

108. Imagine that you have decided to start a new business. Please indicate the extent to which you agree or disagree with each statement about how certain you are that your new business will be able to accomplish each of the following by marking your answer.

	Statements	**(Please mark 'X" your answer.)**				
1	Obtain raw materials.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
2	Attract employees.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
3	Obtain start-up capital.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
4	Obtain working capital.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
5	Deal with distributors.....	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
6	Attract					

	customers……	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
7	Compete with other businesses……..	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
8	Comply with local, state & federal regulations…….	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
9	Keep up with technological advances……..	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
10	Obtain a bank financing……..	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN
11	Obtain venture capital financing……	HIGHLY UNCERTAIN	UNCERTAIN	NEUTRAL	CERTAIN	HIGHLY CERTAIN

109. Imagine that you have decided to start a new business. Please indicate the extent to which you agree or disagree with each statement by marking your answer.

Statements	**(Please mark 'X" your answer.)**				
1 If I work hard, I can successfully start a new business……..	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
2 Overall, my skills and abilities will help me start a business ……..	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
3 My past experience will be very valuable in starting a business ……..	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
4 I am confident I can put in the effort needed to start a business ……..	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
5 Several new companies opened in my community in the last three years……	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
6 I will have to move to another community if I want to start a new business……	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

110. Listed below are some statements about business activity in your community. Please indicate the extent to which you agree or disagree with each statement by marking your answer.

Statements **(Please mark 'X" your answer.)**

1	Many new people moved into my community in the last three years……	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
2	Many people in my community start new businesses……	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
3	People in my community often talk about new business opportunities……..	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
4	Local government official suggests new business possibilities……	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
5	Local university/college suggests new business possibilities	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
6	Village lender suggests new business possibilities……..	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE

111. We would like to understand characteristics about you. Please indicate how accurately the following statements would describe you by marking the answer that applies.

	Statements	**(Please mark 'X" your answer.)**				
1	I am successful in completing new tasks….....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
2	I can reach goals I set for myself……. ……	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
3	I am successful when confronting obstacles….....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE E
4	I can do anything I set my mind to….. …….	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
5	Owning my own business is more important than spending time with my family……..……	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
6	I have no trouble making and keeping friends……	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
7	When I make plans I am almost certain to make them work……	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
8	When I get what I want, it is usually because I worked hard for it……...	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
9	I would be proud of my children if they started their own business……	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE

10	I have been very impressed with the people I know who have their own business…….…….	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
11	I would probably choose the same career path again……....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
12	I usually know what is appropriate in any social situation……..….	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
13	I consider myself a loner..	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
14	I am often concerned about what others think of me……....	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE
15	I am a good judge of character…….	COMPLETELY UNTRUE	UNTRUE	NEUTRAL	TRUE	COMPLETELY TRUE

Risk Perceptions and Risk Motives

112. "Imagine an honest stranger comes up to you and offers a gamble with the payout depending on the flip of a coin. If the coin lands heads you get the amount in the first column and if it lands tails you get the amount in the second column. Each has a 50% chance of occurring. If the gamble was repeated by many flips of the coin you would expect to receive the amount in the third column. While the odds of receiving the amount in the first column are the same as the odds in the second column the high and low values are different. Study the six gambles in the table and select the **one** gamble that you would prefer".

Choice	Gain in Good luck: (RMB): 50% chance	Gain in Bad luck: (RMB): 50% chance	Expected value (RMB)
1	500	500	500
2	950	450	700
3	1200	400	800
4	1500	300	900
5	1900	100	1000
6	2000	0	1000

113. You are offered the opportunity of acquiring a security that provides 50% chance of winning 5,000 RMB and a 50% chance of winning nothing and losing all the capital invested. What is the most you are prepared to pay for this security?
_____ RMB

114. ***Assume you have enough savings*** to buy a following security that provides 50% chance of winning 5,000 RMB and a 50% chance of winning nothing and losing all the capital invested. What is the most you are prepared to pay for this security?
_____ RMB

115.

(*Instruction: Ask the respondent column by column to consider the following lottery. The payoffs and probabilities (which can be explained as a chance of winning) for each of the two outcomes should be read to the respondent. After making sure the respondent understands what is to be won you can simplify by saying something like how much would you be willing to pay for the lottery if there was a 50% chance of winning 100 RMB and a 50% chance of winning 200 RMB , or a 30% chance of winning 226.93 RMB and 70% chance of winning 117.03 RMB. BOTH probabilities and BOTH payoffs must be read to the respondent. If it is easier you can show the following table to the respondent. The respondent may want to think about it for a few seconds. When all three lotteries are complete, show the table to the respondent and ask if he/she is satisfied with the bids; allow for revision)*

Lottery	A		B		C	
Probabilities	0.5	0.5	0.3	0.7	0.7	0.3
Payoff (RMB)	100	200	226.93	117.03	182.37	73.26
How much are you willing to pay for this lottery ticket (RMB)?						

A) Imagine you are offered the opportunity to buy a lottery ticket. You either have a 50% chance of winning 100 RMB or a 50% chance of winning 200 RMB. How much are you willing to pay for this lottery ticket (RMB)?

B) Imagine you are offered the opportunity to buy a lottery ticket. You either have a 30% chance of winning 226.93 RMB or a 70% chance of winning 117.03 RMB. How much are you willing to pay for this lottery ticket (RMB)?

C) Imagine you are offered the opportunity to buy a lottery ticket. You either have a 70% chance of winning 182.37 RMB or a 30% chance of winning 73.26 RMB. How much are you willing to pay for this lottery ticket (RMB)?

The following questions may be sensitive. It would help to understand your situation by asking about important events that may have occurred in your life recently.

116. In your house, is there a family member (within past 3 years) getting divorce?
YES_____, NO_____

117. In your house, have you experienced (within past 3 years) death of a family member?
YES_____, NO_____

118. In your house, is there a family member (within past year) suffering from severe sickness?
YES_____, NO_____

To be answered by interviewer only

119. In your opinion the respondent was engaged in this survey and answered truthfully all questions***?***

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

120. In your opinion the quality of answers provided in this survey is adequate to include in any written reports.

Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

Please make any other relevant comments here:

APPENDIX B

PARTICIPANT SURVEYS IN CHINESE

康奈尔大学/西北农林科技大学

关于信贷需求，风险，农业保险，土地使用者的权利和创业方面评估的村民调查

致受访者：首先感谢您抽出宝贵时间与我们见面。这项调查大约需要45至60分钟，让我再次感谢您的参与。我们正在进行的调查是美国康奈尔大学和西北农林科技大学的合作项目/产品。我们希望收集一些您在当地借款以及应对风险和信用方面面临问题的信息。我们也将询问一些农作物保险，土地使用者的权利和创业方面的问题。您的回答将完全保密，并在任何情况下不可能被识别。此外，我们知道您无法准确记得精确的数字。如果这样，您只需要提供给我们您最佳的判断或估计。最后，您有权利拒绝回答我们问的任何问题。

鉴于此您是否愿意参加这个调查呢？是　　否

如果不愿意参加，可以告诉我们为什么您不愿参与吗?

访问者请注意：如果以上的答案是因为受访人觉得他们没有我们需要的信息，可以问为什么，再解释我们只需要他们尽其努力，而且我们并没有预期所有的受访者都有确切的信息。然后询问他们是否会重新考虑。

访问者请注意 ：如果以上回答涉及隐私的问题，可以提醒受访者，他们的参与将是非常有利于我们的研究，他们将保持匿名，而且他们的隐私将得到保障。然后询问他们是否会重新考虑。

如果**是**...“非常感谢您同意参与。让我们开始吧。我们想先问您一些一般性问题... ...，请翻到问题1。

A：农场的特点与农民风险态度

1. 性别_____男；_____女
2. 年龄_____
3. 村名 _____
4. a）你家有几口人，包括你自己？_____（***调查人：****这里指与受访人分享房屋的所有人口，包括父母，孩子）*
   b）你是户主吗？是_____，否____

5．您最高的教育程度：

a）没上过学
b）上过几年小学
c）小学毕业
d）上过几年初中
e）初中毕业
f）上过几年高中
g）高中毕业
h）大专或大学
i）大专或大学

6．在您生活的村落（社区）您是否从属某个社会团体？（例如：合作社，宗教，志愿服务团体 ，俱乐部等等）？是_____，否_____

7.你们家有几部手机？_____

8.您从事农业有多少年了？_____

9.您家总共有几亩地（1英亩=6.07亩）？不包括租来的？_____

10. 您家还有多少亩地是租来生产农业的？_____

11. 如果您是租来的土地，每亩每年平均租金是多少？_____

12. 总体来讲，与去年相比您会如何描述您所在地区目前的商业环境？

a） _____ 变好了
b） _____相同
c） _____变差了

13. 请列出过去1年，在你种植的作物中，种植和销售排名前5的作物。请按照销售额由高到低排列

排名	作物	总销售 (RMB)
1		
2		
3		
4		
5		

14. 农业收入是您的主要收入吗? 是_____，否_____

15. 您去年全年的收入有多少?包括农场经营，兼业收入，汇款（大约）?
_____ 元

16. 请估计您的全部农场经营收入占15题中您填写的收入的百分比_____（***调查者：****如果受访者不知道确切的数字，告诉他们“我们并不需要一个确切的数字只是一个概数”或“它是少于或超过50%，低于25%等，直到获得一个数字。）*
采访者：*“谢谢您，您的回答对我们非常有帮助。现在我想问一些关于您对风险的态度及您的农场所面临的风险方面的问题”。*

B. 风险来源与风险认知

17. 请指出您是否愿意承担这些风险（圈出您认为最适合的选择）

陈述	不愿意		中立		愿意
我愿意接受更大的生产风险，增加获得较高利润的机会	1	2	3	4	5
在我看到其他农场运用新技术并产生好的结果之前，我愿意承担新技术带来的风险	1	2	3	4	5
在我看到其他农场运用新管理方法并产生好的结果之前，我愿意承担新的管理实践带来的风险	1	2	3	4	5

如果您没有种植玉米或小麦，请忽略18-20题

18．如果您种植玉米和小麦，您预期**明年（2010／11）**最可能卖到的价格是每斤多少元？您预期的最高／最低可能卖到每斤多少元（1斤=500g）？（***采访人提示：****在调查最可能价格预期与最高／最低销售价格预期时，可以告诉采访对象“我们并不需要准确数字，依靠你们过去的生产经验对未来价格作出预测即可”。“最可能价格”是指生产者预期的明年可以卖到的价钱。注意最可能价格预期与最低／最高销售价格预期可以相等。）*

作物种类	最低销售价格预期（元／斤）	最可能销售价格（元／斤）	最高销售价格预期（元／斤）
1 玉米			
2 小麦			

19．如果您种植玉米或小麦，您预期**明年（2010／11）**最可能的产量是每亩多少斤？您预期的最高／最低可能的每亩产量是多少斤？如果您无法准确估计，请将误差控制在10斤／亩内即可。（***采访人提示****：在调查最可能产量预期与最高／最低产量预期时，可以告诉采访对象“我们并不需要准确数字，依靠你们过去的生产经验对未来产量作出预测即可”。“最可能产量”是指生产者预期的明年的产量。注意最可能产量预期与最低／最高产量预期可以相等。）*

作物种类	最低生产产量预期（斤／亩）	最可能生产产量（斤／亩）	最高生产产量预期（斤／亩）
1 玉米			
2 小麦			

20．如果您种植玉米或小麦，在您的记忆中曾经有过的最低和最高产量是多少斤／亩？历史平均产量是多少斤／亩，各自发生的年份是什么时候？如果您无法准确估计，请将误差控制在10斤／亩内即可。（***采访人提示****：如果采访对象不能准确记忆最高／最低产量出现的年份，请提问“这是几年前的产量”，并用以下公式计算：发生年份=2010－X年前）。*

作物种类	最低历史产量（斤／亩）	年份	最高历史产量（斤／亩）	年份	历史平均产量（斤／亩）
1 玉米					
2 小麦					

C. 风险管理方法使用和认知

21. 请分别指出以下各选项中的风险管理方法对你的农场的重要性。如果在你的生产中不使用这些来进行风险管理，请选择“0”。1 =不重要，2 =不很重要，3 =中性，4 =重要，5 =非常重要（圈出您认为最适合的选择）。

风险管理选择	**0 如果没有使用**	**完全不重要**				**非常重要**
不止一种作物或牲畜，作物多样化	0	1	2	3	4	5
田块在不同地点（地理多样化）	0	1	2	3	4	5
灌溉	0	1	2	3	4	5
分散销售：产品的销售不是一次售出，而是在一段时间里销售（多元化营销）	0	1	2	3	4	5
使用合约，事先以固定价格来营销作物	0	1	2	3	4	5
政府项目	0	1	2	3	4	5
保持财物储备：有现金和随时可转换资产（如机械，畜牧）	0	1	2	3	4	5
投资非农以获取其他收入来源	0	1	2	3	4	5

D. 农业保险的使用和认知

采访者：*农作物保险是一种西方农户常用的工具。如果你的某些农作物的产量低于平均单产的百分比之下时，农作物保险将赔付你损失的部分。例如，如果你所种植的特定作物的平均产量为500斤/亩，当实际产量低于这一平均水平的90%时，保险可提供付款。例如，如果实际产量为400斤，你可获得的赔付为（500－400）×平均收获价格。如果价格为0.75元/斤，那么您将收到0.75 ×（500－400）= 75元，但如果产量超过500斤，你将不会从保险公司得到任何赔付。*

22．你所在的地区目前是否有这样的作物保险？ 是_____ 否_____
(如果“否”跳至 Q25)

23．（如果Q22回答“是”）您是否购买了作物保险？ 是_____ 否_____
(如果“否”跳至 Q26)

24．（如果Q23回答“是”）请列出所保的作物。每亩您支付多少钱？

保险的作物	保险费 (元/亩)
1	
2	
3	
4	
5	

25．（如果Q22回答“否”）如果中国将提供作物保险，您是否会购买？
是_____ 否____

26．如果您种植玉米和/或小麦，在来年您认为哪种作物可能有更高的产量损失？
玉米 _____ 小麦 _____***（只能选一种作物）***

27．想象一下，如果政府为你在***26题中选择的作物***提供一个农作物保险产品，它将保证您的每亩年收入不会低于300元人民币。基于过去所有的农作物产量以及您对明年的作物产量的估计，

a）你愿意付18元人民币每亩，以保证300元/亩的最低收入？
肯定买_____可能买____ ___不大可能买_____肯定不买_____

b）你愿意付9元人民币每亩，以保证300元/亩的最低收入？
肯定买_____可能买____ ___不大可能买_____肯定不买_____

c）你愿意付3.5元人民币每亩，以保证300元/亩的最低收入？
肯定买_____可能买____ ___不大可能买_____肯定不买_____

d) 你愿意付1元人民币每亩，以保证300元/亩的最低收入？

肯定买_____可能买____ ___不大可能买_____肯定不买_____

28. 考虑到包括农场，家具家电，房屋，汽车，机械及设备等，您是否定期购买下列保险 ***（如果不适用请留空）***：

a. 人寿保险 是_____ 否___
b. 家庭火灾保险 是_____ 否____
c. 汽车保险 是_____ 否____
d. 健康/医疗保险 是_____ 否____
e. 农民最低生活保障 是_____ 否____
f. 农村养老保险 是_____ 否____
g. 防止作物损失（作物保险） 是_____ 否____
h. 防止牲畜损失（牲畜保险） 是_____ 否____
i. 其他_____

29. 想象一下一个新的贷款产品，有一个内置的保险机制，这样，当发生严重干旱时，随着干旱强度增加你所需偿还的贷款额减少。你是否对这样的贷款产品感兴趣，即使它的贷款利率会增加？

a. 不感兴趣
b. 中度感兴趣
c. 非常感兴趣

E. 农场融资和风险管理

30. 你有任何未偿还的债务吗？是____否____

a. 如果有，请注明你欠的总金额及利率

b. 月利率是_____　　年利率是____

	贷款额	利率
a. 朋友		
b. 亲戚		
c. 正规机构（信用社，农业银行,邮政储蓄等)		
d. 放贷者/当铺		
e. 其他		

31. 如果你卖掉你所有的资产（房屋，土地，家畜，农业生产资料等），你会得到多少（人民币）_____

32. 对于您目前的债务，资产和生产力，您觉得您的债务水平如何？

1 =非常低，2 =低，3 =适中，4 =高，5 =非常高

33. 在你的村庄，这两个说法哪个是最正确的

a. 当地农村信用社或银行对我进行资信评估，并提供贷款，不需要我的申请

对_____ 错_____

b. 我必须正式向当地农村信用社或银行申请贷款　对_____错_____

（问题33 a和b是相互排斥的：如果一个是错的，则另一个是对的）

如果Q33b选择“对”，即跳到Q40

34. （如果Q33a回答是“对”）在**最近**的贷款中农村信用社或银行给您提供约多少贷款？_____（人民币）

35. 在Q34所提供的金额中，有多少贷款（人民币）是你**实际**使用的？（*不要留空。如果没有使用，就填0；如果不知道，就填9999*）_____

36. （如果Q35回答大于零）您将贷款用于什么目的？（可多选 ）

a. 农业生产　是_____ 否____

b. 房屋建筑/翻修　是_____ 否____

c. 购买汽车/摩托车/自行车　是_____ 否____

d. 生活消费　是_____ 否____

e. 医疗消费　是_____ 否____

f. 教育费用　是_____ 否____

g. 其他费用　是_____ 否____

37. 在Q35中您所回答的贷款额（***采访者：****提醒受访人Q35的回答*）小于，等于或大于你在Q36所述的实际所需要的金额吗？

小于_____ 等于_____ 大于_____

38. （如果你的实际贷款金额低于银行提供给你的信贷额度）你认为你**没有**使用全部信贷总额主要的原因是什么（可多选）？

a. 我不需要贷款/我不投资	是_____ 否____
b. 我有自己的钱和储蓄用来投资	是_____ 否____
c. 我从朋友处借钱	是_____ 否____
d. 利率过高	是_____ 否____
e. 担心失去抵押品	是_____ 否____
f. 我信用不够好	是_____ 否____
g. 没有担保	是_____ 否____
h. 贷款产品不够灵活，无法满足我的偿付能力	是_____ 否____
i. 其他?_____	是_____ 否____

39. 你认为你有足够的抵押，以确保比你在*Q37*中的贷款更高的贷款额吗？

是_____ 否____

跳至Q52

---

40. （如果*Q33b*的回答是“对”）在近2年你有从信用社或银行申请贷款吗？

是_____ 否____（***如果否，跳至 Q49***）

41.（如果*Q40*的回答“对”）在最近的贷款申请中大约有多少_____（人民币）

42. 信用社或银行给你提供了多少贷款_____（*如果贷款被拒就填0*）

43.（如果*Q42*大于0）你接受了贷款吗？是_____ 否____（***如果否，跳至 Q46***）

44. （如果 *Q43* 回答是 ）你使用这些贷款的目的是 （可多选）？

a. 农业生产	是_____ 否____
b. 房屋建设/翻修	是_____ 否____
c. 购买汽车/摩托车/自行车	是_____ 否____
d. 生活消费	是_____ 否____
e. 医疗开销	是_____ 否____
f. 教育开销	是_____ 否____
g. 其他?	是_____ 否____

45. 你在Q42接受的贷款额（***采访人：****提醒受访人Q42的回答*）小于，等于或大于你基于Q44目的实际所需要的金额吗？

小于_____等于_____ _____大于_____

46. （如果Q43的回答是“否”）你为什么**没有**接受贷款（可多选）？

a. 银行提供的贷款比我计划投资的少 是_____ 否____
b. 从朋友处借钱 是_____ 否____
c. 利率过高 是_____ 否____
d. 担心失去抵押品 是_____ 否____
e. 贷款产品不够灵活，不能满足我的偿付能力 是_____ 否____
f. 其他? 是_____ 否____

47. 你认为你有足够的抵押，以确保比你在*Q42*中的贷款更高的贷款额吗？

是_____ 否____

48. （如果*Q42*的回答比*Q45*小）银行拒绝了你的部分或全部贷款的主要原因是什么（可多选）？

原因	非常可能	很可能	可能	不太可能	不可能
a. 抵押品不足					
b. 作物/牲畜的价格风险太大					
c.产量风险太大					
d. 作物生长受到天气影响的脆弱性					
e.过去有过还不了款的经历					
f.银行对我不信任					
g.我的银行不相信我有足够的收入					
h.信用社还款的时间与我农场销售的时间不吻合					
i.找不到人担保					
j.其他，请指出					

跳至Q52

49. （如果*Q40*的回答是否）在近2年里你为什么没有向信用社或银行借款？（可多选）

a. 我不需要贷款/我不投资	是_____	否____
b. 我有自己的钱和储蓄用来投资	是_____	否____
c. 从朋友处借钱	是_____	否____
d. 利率过高	是_____	否____
e. 担心失去抵押品	是_____	否____
f. 我信用不够好	是_____	否____
g. 没有担保	是_____	否____
h. 贷款产品不够灵活，不能满足我的偿付能力	是_____	否____
i. 其他?	是_____	否____

50. 你是否相信你有足够的抵押品获得足够的贷款？

是_____ 否____不确定_____

51. （如果Q50的回答是否或不确定）假设你有足够的抵押品保证你需要的贷款，你会多借吗？

是_____ 否____不确定_____

继续回答Q52

52. （如果Q38(e) 或 Q49(e)的回答“是”，即在前面你指出了自己担心失去抵押品）你为什么担心失去抵押品呢？

a. 我不能冒险失去我的生意

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

b. 我不能冒险不送孩子上学

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

c. 我不能冒险没有足够的钱买食物

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

d. 我不能冒险没有足够的钱支付医药费

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

e. 我不能冒险没有房子住

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

f. 我不能冒险当我退休或年老的时候没有足够的钱
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

g. 我不能冒险失去未来获贷的机会?
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

h. 我不能冒险失去在村里的社会声誉
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

i. 我不能冒险没有足够的储蓄来弥补抵押品的损失
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

j. 我已经老了，我想要安稳的生活
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

k. 我没有从事非农工作的技能
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

53. （如果Q38(g) 或 Q49(g)的回答“是”）如果你可以获得担保，你会申请贷款吗？
是_____ 否____

以下的问题每位受访人都必须回答

54. 你当地的信用社认为你是否是个有信用的借款人吗？是_____ 否____

55. 目前贷款正规机构有要求小组担保/农户联保以获得贷款吗？是_____ 否____
56. 你是小组担保/农户联保的成员吗？是_____ 否____

57. （如果Q56的回答“是”）因为我是担保小组的成员，我可以得到更多的贷款
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

58. （如果Q56的回答“是”）因为我是担保小组的成员，我可以得到较低的利率
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

59. （如果Q56的回答“否”）我不是担保小组的成员，因为我不需要从信用社或银行借款
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

60. （如果Q56的回答“否”）我不是担保小组的成员，因为我不想从信用社或银行借款
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

61. （如果Q56的回答“否”）我不是担保小组的成员，因为我不被认为是值得放贷的人
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

62. （如果Q56的回答“否”）我不是担保小组的成员，因为我不愿为其他人贷款担保
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

63. （如果Q56的回答“否”）我不是担保小组的成员，因为手续太麻烦
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

64. 目前你欠信用社或银行多少钱_____元
如果数额> 0 请回答 Q64 a），如果数额 = 0请回答 Q64 b）

64 a）假设目前信用社的年利率为7%。你可以在此利率下满足你所有的信贷需求，如果年利率发生如下变化，你将有何行为？

新利率%	肯定借很多	肯定借一些	可能借很多	可能借一些	肯定不借
6					
5					
4					
3					

新利率%	肯定借的很少	肯定借的少	可能借的很少	可能借的少	肯定不借
8					
9					
10					
11					

64b) 你在信用社或银行没有借款，假设如下利率可以满足你所有的信贷需求。给定如下利率，你会如何调整自己的借贷行为？

利率%	肯定多借	肯定借一些	可能多借	可能借一些	肯定不借
3					
4					
5					
6					
7					
8					
9					
10					
11					

65．在相同利率下，如果我可以从放贷人那里借到比我目前更多的款项，我会更倾向从放贷人那里借钱。
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

66．我愿意付比目前信用社或银行更高的利率获得更大数量的贷款
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

67．如果放贷人的利率比现行利率低，我会更倾向向放贷人借款
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

68．如果从信用社或银行获得贷款的成本（收费，非利息费用）比目前的成本低，我会倾向从信用社或银行贷款。
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

69．在以下每种情况下，你有过推迟还款吗？*（**采访人**：推迟是指没有在贷款人约定的时间还，但最终偿还了）*

	是	否
a. 朋友		
b. 亲戚		
c. 正规金融机构（信用社，农业银行，邮储		
d. 放贷人/当铺		
e. 其他？请指出		

70. 在以下每种情况下，你有过还款违约吗（没有还款）？（***采访人：****违约是指没有按贷款人约定还款）*

	是	否
a. 朋友		
b. 亲戚		
c. 正规金融机构（信用社，农业银行，邮储		
d. 放贷人/当铺		
e. 其他？请指出		

采访者：*现在我想了解一下您周围的储蓄和借贷环境。*

71. 您一年的家庭收入中有多少比例可用于存款：
a）没有　　b）少于5%　c） 5 - 10%　　d）大于10%

72. 你存款的目的是什么（如果有必要，可多个答案）？
a. 我存款是因为我目前没有需要花钱的地方
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

b. 我存款是因为我想要盖房子/扩建房子
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

c. 我存款是为了防止我需要修房子
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

d. 我存款想买机动车(例如汽车,摩托车,拖拉机等)
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

e. 我存款以防备我的机动车(例如汽车,摩托车,拖拉机等)突然坏掉
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

f.我存款想旅游/休闲花费
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

g. 我存款想在未来进行非农投资
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

h. 我存款以确定我能偿还我的贷款
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

i. 存款以防紧急医疗需要
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

j. 存款送孩子上学/上大学
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

k.存款为了将来给孩子结婚盖房子、送彩礼
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

l. 存款赡养父母
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

m. 存款以防失业
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

n. 存款以防不可预期的作物损失
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

o. 其他
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

73. 你认为储蓄重要吗？
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

74.
(a) 从信用社或银行获得贷款你有顾虑吗？有_____没有_____
(b) 我曾经有未偿还的贷款
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

(c) 信用社和银行的贷款利率比我从朋友亲戚处借款来得高
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

(d) 信用社和银行的贷款利率高负担不起
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

（e）我更愿意从朋友和亲戚处借钱
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

(f) 我不喜欢欠银行或农村信用社的钱
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

F. 信贷配给的影响

*请回答下列问题。在这里我们使用术语"**借款约束**"。借款约束是指农民无法获得从信用社或银行要求的数额或在急需贷款的时间内筹集到全部资金。*

75. 如果面临借款约束我会使用比要求更少的投入来最大化我的农业收入
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

76. 如果面临借款约束我将需要从事非农生产以获得收入
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

77. 如果面临借款约束我将不能为我的孩子提供足够好的教育和足够的健康保护
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

78. 如果面临借款约束，我的家人包括我自己不能获得整年的食物
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

79. 如果我能从信用社获得足够的我需要的贷款,我可能会(***只选择是的回答***)
a) 离开农业开始非农业生产 是_____ 否____
b) 离开农业在非农部门工作 是_____ 否____
c) 继续留在农业扩大农业生产 是_____ 否____
d) 留在农业也开始非农经营 是_____ 否____
e) 以上皆非

80. 与其跟亲戚借钱我更喜欢获得很低利率的贷款
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

81. 与其跟亲戚借钱我更喜欢按当前市场利率申请贷款
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

82. 与其跟朋友借钱我更喜欢获得很低利率的贷款
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

83. 与其跟朋友借钱我更喜欢获得价格为当前市场利率的贷款
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

G.土地使用权

政治上有关于农田使用权转让（此指买卖）的讨论。假设政府使农民购买或出售土地使用权合法化，请回答下列问题。

84. 您种植的作物每亩的平均利润是多少？_____元

85. 每个土地使用权包括多少亩土地？_____亩

86. 如果政府使农民购买或出售土地使用权合法化，我将(只选择是的回答)

a）出售土地使用权，并开始非农业生产	是_____否_____
b）出售土地使用权在非农业部分工作	是_____否_____
c）购买土地使用权并扩大农业生产	是_____否_____
d）购买土地使用权，并开始非农经营	是_____否_____
e）什么也不做	是_____否_____

87. （若*Q86* 的回答是 a 或 b）如果今天出售土地使用权，你可以接受的最低价格是多少？_____元

88. （若*Q86* 的回答是 a 或 b）

你有买3张彩票的机会(A, B 和 C)，中奖概率各不相同(50% : 50%)，(70% : 30%) 和 (30% : 70%)。如果你的彩票中了，你会得到一个土地使用权（它的价值是你在Q87中指出的价值），除了彩票本身的价格以外你不需要支付其他成本。你将享受土地使用权范围内的所有权利。如果你的彩票没有被选中，你什么也得不到。

说明：*请要求受访者逐列作答。每种概率（可以看作是赢的机会）的结果请读给受访者听。对于每张彩票都需要提醒受访人他在Q87的出价，因为这是他将要赢得的金额。在确认被受访人明白他将赢到或者输掉什么之后，可以简单的解释，如果赢的机会各有50%，或70%的获胜机会，30%会输，你愿意为彩票出价多少？两种概率都必须读给受访人听。你也可以把下表给受访人看，受访人可能要考虑几秒钟。当所有三个彩票填完整后，再次把表格给受访人看，询问他/她是否满意出价。（允许修改）*

你最希望付的每张彩票的价格（如果不想买请填写0）

	彩票 A 的概率	彩票 B 的概率	彩票 C 的概率
如果你的彩票中了，你会得到一个土地使用权（它的价值是你在Q87中指出的价值），除了彩票本身的价格以外你不需要支付其他成本。你将享受土地使用权范围内的所有权利。	50%	70%	30%
如果你的彩票没有被选中，你什么也得不到	50%	30%	70%
你最希望付的每张彩票的价格（如果不想买请填写0）			

89. （若*Q86* 的回答是 a 或 b），你打算如何使用你出售土地使用权获得的金钱？

a）支付债务

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

b）日常家庭开支

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

c）支付医疗费用

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

d）退休基金

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

e）投资金融资产（例如：股票，债券，共同基金等）

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

f）投资现有的农业商业活动

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

g）投资现有的非农商业活动

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

h）投资新的农业商业活动

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

i) 投资新的非农商业活动
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

j) 花费在一次性的家庭支出中（如房屋修缮，购买机械等）
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

k) 礼物或慈善
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

i）还没决定如何使用这些钱
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

m) 其他？
非常同意_____比较同意_____同意_____不同意_____非常不同意_____

90. （若*Q86* 的回答是 c 或 d）如果今天购买土地使用权，你愿意支付最高的价格是多少？_____元

91. (若*Q86* 的回答是 c 或 d)

你有买3张彩票的机会(A, B 和 C)，中奖概率各不相同(50% : 50%), (70% : 30%) 和 (30% : 70%)。如果你的彩票中了，你会得到一个土地使用权（它的价值是你在Q90中指出的价值），除了彩票本身的价格以外你不需要支付其他成本。你将享受土地使用权范围内的所有权利。如果你的彩票没有被选中，你什么也得不到。

说明： *请要求受访者逐列作答。每种概率（可以看作是赢的机会）的结果请读给受访者听。对于每张彩票都需要提醒受访人他在Q90的出价，因为这是他将要赢得的金额。在确认被受访人明白他将赢到或者输掉什么之后，可以简单的解释，如果赢的机会各有50%，或70%的获胜机会，30%会输，你愿意为彩票出价多少？两种概率都必须读给受访人听。你也可以把下表给受访人看，受访人可能要考虑几秒钟。当所有三个彩票填完整后，再次把表格给受访人看，询问他/她是否满意出价。（允许修改）*

你最希望付的每张彩票的价格（如果不想买请填写0）

	彩票 A 的概率	彩票 B 的概率	彩票 C 的概率
如果你的彩票中了，你会得到一个土地使用权（它的价值是你在Q90中指出的价值），除了彩票本身的价格以外你不需要支付其他成本。你将享受土地使用权范围内的所有权利。	50%	70%	30%

如果你的彩票没有被选中，你什么也得不到	50%	30%	70%
你最希望付的每张彩票的价格（ 如果不想买请填写0）			

92. （**每个人必须回答的问题**）如果你可以用你的土地使用权作为贷款抵押，你将肯定多借很多_____可能多借很多_____不会多借很多_____多借很少_____不多借_____

93. 假设你有机会可以买卖土地所有权，在以下每种价值下，你会选择买还是卖？

		若买	若卖	你会				
方案	土地使用权	借款10年付完	获得销售额以及每年10%的投资收入	肯定买	可能买	不买不卖	可能卖	肯定卖
1	300,000	44,709	30,000					
2	150,000	22,354	15,000					
3	100,000	14,903	10,000					
4	75,000	11,177	7,500					
5	60,000	8,942	6,000					
6	50,000	7,451	5,000					
7	42,857	6,387	4,286					
8	37,500	5,589	3,750					
9	33,333	4,968	3,333					
10	30,000	4,471	3,000					
11	27,273	4,064	2,727					
12	25,000	3,726	2,500					
13	23,077	3,439	2,308					
14	21,429	3,193	2,143					
15	20,000	2,981	2,000					

H. 创业

请告诉我们您认为自己创业的可能性。

94. 你曾经有过新生意吗？是_____否_____

95. 除你之外，你自己知道在你们社区或其他地方有人开始他们自己的生意吗？是_____否_____

96. 你是否考虑过开始新的生意，全职或兼职的

a)_____是，全职

b)_____是，兼职

c)_____否

97. 你计划开始新生意吗？是_____否_____

98. (若 Q97回答“是”),你计划开始什么生意?

j) 零售商_____
k) 批发商 _____
l) 食品加工 _____
m) 制造商 _____
n) 特许权经营 _____
o) 服务业_____
p) 旅店 _____
q) 建筑 _____
r) 其他_____

99. 如果你可以买卖土地使用权，这是否会影响你开始新生意的决定？是_____否_____

100. 你家里有电脑吗？是_____否_____

101. 你家里能上网吗？是_____否_____

102. 你用网络和e-mail从事商业活动吗？是_____否_____

103. (如果适用)您和您的配偶工作状况如何？ (在每栏数字后做标记)

您本人	配偶	
1____	1____	全职干农活

2____ 2____ 全职当地非农工作

3____ 3____ 外出务农

4____ 4____ 外出务工

5____ 5____ 全职工作

6____ 6____ 临时工作

7____ 7_____ 失业

8____ 8____ 家庭工作/家庭主妇

9____ 9____ 家庭手工制作

10____ 10____ 退休

11____ 11____ 在上学

104.

A)如果您或家人(直系亲属)或好朋友是村领导的请标上“X”

自己_____ 家人 _____ 好朋友 _____

B)如果您或家人(直系亲属)或好朋友在村委会的请标上“X”

自己_____ 家人 _____ 好朋友 _____

C)如果您或家人(直系亲属)或好朋友在省政府工作的请标上“X”

自己_____ 家人 _____ 好朋友 _____

D)如果您或家人(直系亲属)或好朋友在县政府工作的请标上“X”

自己_____ 家人 _____ 好朋友 _____

E)如果您或家人(直系亲属)或好朋友在国有企业工作的请标上“X”

自己_____ 家人 _____ 好朋友 _____

F)如果您或家人(直系亲属)或好朋友在信用社或银行工作的请标上“X”

自己_____ 家人 _____ 好朋友 _____

105. 我们想了解您所在的社区对新的商业的支持程度。请说明在何种程度上你同意或不同意以下的说法。

表述　　（请在您的回答处标上“X”）

1	那些成功的商业/生意获得很多关注和尊敬	非常不同意	不同意	中立	同意	非常同意
2	年轻人被鼓励创业（开始他们自己的生意）……	非常不同意	不同意	中立	同意	非常同意
3	省和地方政府给创业人员提供较好的支持 ..	非常不同意	不同意	中立	同意	非常同意
4	银行家在创业初期也给予帮助…….	非常不同意	不同意	中立	同意	非常同意
5	信用社在创业初期也给予帮助……	非常不同意	不同意	中立	同意	非常同意
6	投资者在创业初期也给予帮助…….	非常不同意	不同意	中立	同意	非常同意
7	其他社区团体在创业初期也给予支持……	非常不同意	不同意	中立	同意	非常同意
8	当地媒体对当地商业新闻做了很好的工作……	非常不同意	不同意	中立	同意	非常同意
9	在这一社区多数的领导都有他们自己的生意……	非常不同意	不同意	中立	同意	非常同意

10	有很多那些创业获得成功倍受尊重的榜样……	非常不同意	不同意	中立	同意	非常同意

106. 再次想象一下如果你决定开始创业，请对以下这些在你创业初期你可能遇到的问题选择你的真实想法

表述　　（请在您的回答处标上“X”）

1	作为商人被特殊对待	完全不正确	不正确	中立	正确	完全正确
2	协调好生意，个人和家庭的时间	完全不正确	不正确	中立	正确	完全正确
3	没有导师提供建议和支持..……	完全不正确	不正确	中立	正确	完全正确

107. 现在将我们的关注转向新闻媒体和你们社区的交流来源，对于每个来源的信息你认为有多可靠，请选择你的答案

表述　　（请在您的回答处标上“X”）

1	报纸	不可信	有点可信	可信	很可信	非常可信
2	电视/广播	不可信	有点可信	可信	很可信	非常可信
3	网络	不可信	有点可信	可信	很可信	非常可信
4	家庭成员	不可信	有点可信	可信	很可信	非常可信
5	朋友	不可信	有点可信	可信	很可信	非常可信
6	当地政府官员	不可信	有点可信	可信	很可信	非常可信
7	当地大学/学院	不可信	有点可信	可信	很可信	非常可信
8	村放贷人	不可信	有点可信	可信	很可信	非常可信

108. 想像你决定创业，对于下列每个方面你有多大程度的把握？请标出你是否同意以下的说法

表述　　（请在您的回答处标上“X”）

1	获得原材料	非常不确定	不确定	中立	确定	非常确定
2	吸引员工	非常不确定	不确定	中立	确定	非常确定
3	获得创业资本	非常不确定	不确定	中立	确定	非常确定
4	获得流动资本	非常不确定	不确定	中立	确定	非常确定
5	与分销商打交道	非常不确定	不确定	中立	确定	非常确定
6	吸引客户	非常不确定	不确定	中立	确定	非常确定
7	与他企业竞争	非常不确定	不确定	中立	确定	非常确定
8	遵守地方，省和国家的规定	非常不确定	不确定	中立	确定	非常确定
9	保持先进的技术	非常不确定	不确定	中立	确定	非常确定
10	获得银行的融资	非常不确定	不确定	中立	确定	非常确定
11	获得风险投资的融资	非常不确定	不确定	中立	确定	非常确定

109. 想像你决定创业，请对以下的说法选择你同意的程度

表述　　（请在您的回答处标上“X”）

1	如果我努力工作，我就能创业	非常不同意	不同意	中立	同意	非常同意
2	总体而言，我的技术和能力将帮助我创业…….	非常不同意	不同意	中立	同意	非常同意
3	我过去的经验对我创业很有价值……..	非常不同意	不同意	中立	同意	非常同意
4	我相信自己能够尽最大努力来创业	非常不同意	不同意	中立	同意	非常同意
5	在过去的三年里在我们社区开了许多新公司	非常不同意	不同意	中立	同意	非常同意
6	如果我要创业我不得不到另一个社区……	非常不同意	不同意	中立	同意	非常同意

110. 以下列出了您社区的一些商业活动，请对以下的说法标出你同意的程度

表述　　（请在您的回答处标上“X”）

1	在过去的三年里许多人搬入我们的社区……	非常不同意	不同意	中立	同意	非常同意
2	我们社区的许多人开始创业……	非常不同意	不同意	中立	同意	非常同意
3	我们社区的许多人谈论创业的机会……..	非常不同意	不同意	中立	同意	非常同意
4	地方政府官员建议新的商机……	非常不同意	不同意	中立	同意	非常同意
5	地方高校建议新的商机……	非常不同意	不同意	中立	同意	非常同意
6	村里的贷款人建议新的商机…… …….	非常不同意	不同意	中立	同意	非常同意

111. 我们希望了解一些您个人的性格特征，请标出以下对您描述的准确程度

表述　　（请在您的回答处标上“X”）

1	我总能成功完成新任务.….	完全不真实	不真实	中立	真实	完全真实
2	我能达到我为自己设定的目标……	完全不真实	不真实	中立	真实	完全真实
3	面临障碍的时候我依然很成功.….	完全不真实	不真实	中立	真实	完全真实
4	我能做我决定做的任何事…….	完全不真实	不真实	中立	真实	完全真实
5	拥有自己的事业/生意比花时间与家人在一起更重要..……	完全不真实	不真实	中立	真实	完全真实
6	结交朋友对我来说并不难	完全不真实	不真实	中立	真实	完全真实
7	我制定的计划几乎都是可行的	完全不真实	不真实	中立	真实	完全真实
8	我得到我想要的常常是因为我的努力工作	完全不真实	不真实	中立	真实	完全真实
9	如果我的孩子开始创业，我会为之感到骄傲	完全不真实	不真实	中立	真实	完全真实
10	我对那些我认识的拥有自己事业/生意的人有很深的印象	完全不真实	不真实	中立	真实	完全真实
11	如果可以重新选择，我仍然会选择相同的职业生涯	完全不真实	不真实	中立	真实	完全真实

12	在任何社会情况下，我总是知道什么是适当的	完全不真实	不真实	中立	真实	完全真实
13	我喜欢独处	完全不真实	不真实	中立	真实	完全真实
14	我经常担心别人如何看待我…...	完全不真实	不真实	中立	真实	完全真实
15	我能很好的判断别人	完全不真实	不真实	中立	真实	完全真实

I. 风险认知和风险动机

112. “想象一下，一个诚实的陌生人过来和你玩一个投硬币付款的游戏。如果硬币为正面，你将得到第一列里的金额，如果是反面，你将得到第二列里的金额。正反面发生的可能性各为50%。如果重复扔硬币，你将预期获得在第三列的金额。尽管获得第一列与第二列的概率是相同的，但价值有高有低。研究表中的六个方案，选择一个你喜欢的。

方案	获得好运 (RMB): 50% 的机会	获得背运 (RMB): 50% 的机会	期望价值 (RMB)
1	500	500	500
2	950	450	700
3	1200	400	800
4	1500	300	900
5	1900	100	1000
6	2000	0	1000

113.您有机会购买一种债券，它可以让您以50%的概率赢得5000元人民币和50%的概率什么也得不到（同时还会失去您购买彩票的成本）。 您愿意为它支付多少？
_____元

114. **假设您有足够的积蓄**购买一种债券，它可以让您以50%的概率赢得5000元人民币和50%的概率什么也得不到（同时还会失去您购买彩票的成本）。您最愿意为此支付多少？_____元

115.

说明：要求受访人逐列考虑以下彩票。请告诉受访者每种彩票的两种可能回报和相应概率（可以看作是赢的机会）。在确认受访人明白他将赢得或失去什么后，可以简单的解释如果有50％的机会赢100元和50%的机会赢200元，或30％的机会赢*226.93*，70％的机会赢*117.03*，你愿意为彩票付出多少？两种概率和回报必须读给受访人听。如果更容易些可以把下表给受访人看，受访人可能要考虑几秒钟。当所有三个彩票填完整后，再次把下面的表格给受访人看，询问他/她是否满意出价。（允许修改）

彩票	A		B		C	
概率	0.5	0.5	0.3	0.7	0.7	0.3
回报彩金（元）	100	200	226.93	117.03	182.37	73.26
你愿意为彩票付多少钱						

A）假设您有机会购买彩票。您有50％的机会赢得100元人民币,50％的机会赢得200元。你愿意出多少钱购买此彩票（人民币）？

B） 假设您有机会购买彩票。你有30％的机会赢得226.93元人民币,70％的机会赢得117.03元。 你愿意出多少钱购买此彩票（人民币）？

C） 假设您有机会购买彩票。你有70％的机会赢得182.37元人民币,30％的机会赢得73.26元。 你愿意出多少钱购买此彩票（人民币）？

以下三道问题可能有些敏感，请**自愿作答**。我们想了解一下你最近的生活中发生的重要事件，以更好的了解您现在的生活处境。

116. 在您的家中，过去三年中是否有家庭成员离异？
是_____否_____

117. 在您的家中，过去三年中是否有家庭成员去世？
是_____否_____

118. 在您的家中，去年是否有家庭成员生重病？
是_____否_____

采访人作答

119. 根据你的看法，受访人真实回答了所有问题

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

120. 根据你的看法，此调查的信息质量可以满足书面报告的要求

非常同意_____比较同意_____同意_____不同意_____非常不同意_____

请写下其他有关意见：